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PREFACE

This text is intended for use in training courses, or for home study, by individuals who require certification as graduates of the Conservation and Outdoor Recreation Education (C.O.R.E.) program. Much of the information in this text will be of use to a wide variety of outdoor recreationists. It is hoped that this book will have a place as an information source for any person concerned with conservation, outdoor recreation, or the use of firearms whether taught in evening courses, schools or studied alone by the keen individual.

This book has evolved from the text Fish and Wildlife the Recreational Resource first published in 1972 by the then Ministry of Recreation and Conservation. Liberal use has also been made of the information and photographs found in the Alberta text, Conservation and Hunter Education published in 1986 by the Forestry, Lands and Wildlife Ministry.

As described in the following introduction, six chapters of this book form the basis of the C.O.R.E. program examinations. The marked pages of supplementary information and additional chapters, Freshwater Fisheries and Ecology and Wildlife Management contain a great deal of valuable information and are recommended reading for all students. An effort has been made to make this text attractive and durable, one that will have a life as a reference past its initial service as a student text. Its readability is compatible with the ability of students of age 13 or older. Goals, objectives and reviews have been included so that the substance and direction of program related chapters are emphasized for student and instructor alike.

This text is not intended to convince you to become a hunter nor is it the intention to improve hunting success. The question of whether to hunt or not is a personal one. If you choose not to hunt it is just as important that you understand how modern hunting can be used by wildlife managers and how firearms must be handled safely. Hopefully, information in this text coupled with the knowledge of instructors will instill in program participants, an appreciation of hunting, safe firearms use and a respect for property.

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Grateful appreciation must also be given to all contributors to the text which this book succeeds, Fish and Wildlife: The Recreational Resource.

A special note of thanks goes to the British Columbia C.O.R.E. examiners and instructors for their dedication to hunter safety training and their constructive suggestions for improvement of this text.

Geoffrey Swannell: C.O.R.E. Coordinator
Ministry of Environment, Wildlife Branch

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INTRODUCTION

What is Core?

CORE stands for Conservation and Outdoor Recreation Education. It is an educational program designed for individuals wanting to obtain a hunting licence in British Columbia. Anyone 14 years of age and over must successfully complete the CORE program before obtaining their first hunting licence.

The purpose of the program is to ensure that new hunters meet acceptable standards of knowledge and skill for safe and responsible hunting. CORE covers 6 required topics that form the basis for the CORE examinations: outdoor survival and safety, firearms safety, animal identification, bird identification, hunting law and regulations, and hunter ethics. In addition, there are 2 informational chapters on ecology and wildlife management, and fisheries which will not be examined.

The CORE program has been required of prospective hunters since 1974, and has made a noticeable and positive difference in the knowledge, attitude, ethics, and safety of participants.

CORE contains two components, each with a required student test. The first component is the theoretical portion, based on the required 6 chapters in this text, and the Hunting and Trapping Regulations Synopsis. The second part is the practical firearms test, which consists of knowledge and safety skills applied to firearms and ammunition used in hunting. Both instruction and testing of the firearms component may be carried out in the classroom.

How To Prepare for CORE Exams

You may prepare for the CORE exams by self study of the CORE text and the Hunting Regulations Synopsis, or by taking a CORE course offered in your community by independent instructors. Although not compulsory, it is recommended that you take classroom instruction to prepare for the exams. Classroom courses provide more in-depth study of the material, encourage questions and discussion, and allow any potential problems or difficulties to be cleared up. Many courses provide the experience of handling a variety of firearms under different conditions, including supervised live firing practice. Courses are advertised through the local media, sporting goods stores, adult education institutes, or rod and gun clubs in your area. Instructors usually provide complete examination preparation and make all exam arrangements with certified examiners.

Students doing self study of the text materials should devote approximately 6 hours of study and practice to the text chapter "Firearms Safety", and about 3 hours to each of the other 5 required chapters. Use the goal, listed objectives, and chapter reviews as guides when studying the required material used for testing. The two chapters, *Ecology and Wildlife Management* and *Freshwater Fisheries* will not be used for test purposes, nor will informational material in clearly marked *supplemental* sections found in the other chapters. In either case, you must pass the written and practical examinations offered by certified CORE examiners.

Certified CORE examiners are certified by the Wildlife Branch, Ministry of Environment, and are independent volunteers who operate on their own schedules. Mutually agreeable arrangements for testing should be made well in advance of the desired examination date. Certified CORE examiners provide examinations and the graduate CORE certificates to those who successfully take the written and practical firearms examinations. A small standard fee is payable to the certified examiner for each examination provided.

Examiners throughout the province may be contacted by consulting a list available at the nearest offices of the Government Agent or Ministry of Environment.

Further information concerning the examinations is found at the end of this textbook.

1

OUTDOOR SURVIVAL AND SAFETY

INTRODUCTION

Goal of the Chapter

The goal of this chapter is to enhance your enjoyment of hunting recreation and to prepare you for emergency situations that may arise.

Objectives of the Chapter

This chapter will teach you:

(1) to identify the facts or behaviors that may prevent a survival or first aid situation from arising;

(2) to identify the best behaviors for a given survival or first aid situation;

(3) to identify common injuries and illnesses from their signs or symptoms;

(4) to state the best reason for selecting a particular survival or first aid activity or technique for a given situation;

(5) to be able to choose the best definition for names or terms used in survival or first aid; and

(6) to prepare a suitable survival and first aid kit for taking to the outdoors.

This Chapter is divided into two parts:

I. Preparation for Hunting
II. Dealing With Survival Situations.

I PREPARATION FOR HUNTING

Outdoor safety begins with good preparation. If you prepare yourself for a hunting trip you can avoid many of the safety and first aid situations that could arise. Preparation includes three aspects:

(1) Prepare yourself: This includes being mentally ready to go hunting, dealing with problems before you leave home, knowing your health and fitness level, and learning about safety and first aid;

(2) Prepare your equipment: Putting together your basic equipment including a safety kit and a first aid kit and learning how to use them; and

(3) Practice safe behaviour: When on your hunting trip, hunt with a partner and tell someone where you are going and when you will return.

1. Preparing Yourself for Your Hunting Trip

Experienced hunters prepare themselves before each hunt. This preparation can be basic or made more thorough by taking courses. You should prepare yourself in these areas:

(1) mentally;
(2) physically;
(3) medically;
(4) safety and first aid;
(5) know the region; and
(6) plan with your hunting companions.

(1) Mentally

Know yourself and your capabilities and develop a calm, alert frame of mind. Deal with any personal problems so you are not distracted by them on your hunt.

(2) Physically

Exercise on a regular basis for at least a month before your hunt. Hunting requires a lot of energy, strength, and endurance. You will be walking long distances carrying a pack and rifle, and you may have to carry heavy loads through dense bush or over hills. Bad weather is always a possibility. If you are fit you will be able to handle these situations.

(3) Medically

Make sure you have no serious medical problems. Have a checkup before you go. This can prevent problems from developing while you are in a remote area. Get medical attention for small problems such as a cold or a blister to prevent them from developing into serious problems on your hunt.

(4) Safety and first aid

Learn all you can about safety and first aid. Take a first aid course. Read books and manuals. Practice making a fire, building a shelter, reading a compass and map, first aid techniques, and other safety activities. With practice, you will be able to perform these activities more easily if an emergency or first aid situation should happen.

(5) Know the region

Learn all you can about the area where you are going to hunt. Study a map of the area and locate good areas to camp. Know the terrain. Is it hilly? Are there rivers or streams? What is the vegetation like? What will the weather be like? This information will guide you in choosing your equipment.

(6) Plan with your hunting companions

Choose your hunting companions carefully. Are they skilled, safe, and reliable? Will they make good companions in camp conditions? Have they prepared mentally

and physically for the hunt? Do they have any medical problems that you should know about?

2. Packing For Your Hunting Trip

You will need basic equipment on any hunting trip. Plan ahead. Knowing what to expect in the way of terrain, weather, shelter, and water and planning for these conditions are essential to a successful hunt. This equipment is important for day trips or long back-packing trips. Basic equipment can be expanded or varied to meet the needs of specialized hunting trips. The basic equipment includes:

(1) clothing;
(2) compass and maps;
(3) survival kit;
(4) first aid kit;
(5) firearm and ammunition; and
(6) other equipment.

(1) Clothing

Generally, your clothing should be light weight and not hamper your movements. Your clothing should be functional and you should dress in layers. You should break in any new clothes, particularly boots, before your hunt.

You should always take extra clothes and socks so you have a complete change if you get wet.

Clothes for outdoor use must have three qualities:

- They must provide *insulation* to keep you warm.

- They should offer you *protection* from heat, cold, getting wet, cuts and scratches, and from being mistaken for game.

- They must be *absorbent* to soak up sweat. They should not be completely waterproof, but should "breathe" to allow moisture to evaporate.

Hat

In almost any weather a hat should be included with your hunting gear. In cold weather, it is very important to wear a hat since body heat is lost faster through the head than from anywhere else on the body. Your hands and feet will remain warm longer if your head is covered and warm. In bright sun a hat shades your eyes and protects you from sun burn.

Your hat should fit well so it cannot be easily knocked off or nudged over your eyes by tree branches.

Clothing

Your clothes should prevent you from getting wet. Clothing that is completely waterproof will shed rain and wet weather, but does not provide insulation or absorb perspiration. Without insulation to keep you dry, you will likely feel either very cold or extremely hot while wearing totally waterproof garments.

Your clothes should protect you from cuts and scratches. Jeans, jackets, and gloves will help. Your clothes should be strong and not tear easily in heavy brush.

Your outer clothing should be a bright colour to protect you from being mistaken for game. You can also wear a "hunter orange" vest over your clothes.

Always wear layers of clothes as you can easily take a layer off or add one to adjust your temperature. Clothes will also provide shade from the sun.

In cold weather you should wear long thermal underwear for extra insulation and absorbency.

Heavy cotton shirts are suitable in mild weather, but wool should be used in cold weather. Pants can be of any hardy fabric including cotton twill, duck, denim, or wool. Wool is a very useful fabric as it provides some insulation against the cold even when it gets wet.

Boots

Your boots and socks are very important. Care and conditioning of the feet and proper fitting boots are essential to the hunter's well-being. Boots which fit poorly can cause painful blisters and a blister can be a major injury when walking far from camp. Friction from boots that are too large, loosely laced boots, or lumpy or wrinkled socks can cause blisters. Wearing two pairs of wool socks will keep your feet warm and soak up sweat.

Break in a new pair of boots before you go hunting by wearing them on short hikes. Lace your boots snugly around your foot, but less tightly around your ankle. To do this, lace the boot firmly to the top of the instep and tie a reef knot there to hold the tension. The laces can then be comfortably laced from the instep to the top of the boot.

The weight of your boots is very important. Even a few ounces of extra weight carried for many miles can be equal to several hundred pounds of physical exertion. Boots should be sturdy, with strong soles that will not slip and slide on rocky trails, but avoid wearing boots heavier than you need.

Boots bought for hunting should be a half size larger than your regular shoe size to allow room for thick socks and innersoles and for some swelling of your feet which is normal during hard walking.

Gloves

Gloves are a necessary part of a hunter's gear. They help keep you warm and protect your hands from cuts, blisters, splinters, and other injuries.

Jackets

Hunting coats vary with the season. In mild weather a denim jacket is light-weight and hard-wearing. A long-sleeved lumberjack shirt of heavy wool is also suitable for mild weather. Down vests are light-weight, warm, and allow great freedom of movement. For extremely cold weather conditions a down-filled jacket with hood is best.

(2) Maps

All hunters should learn to use a map and compass. The best maps to use are topographical maps. These show the elevations of hills and valleys, and landmarks such as ponds, vegetation, swamps, roads, and buildings. You can get maps with a scale of 1:25,000 (which is about 2 1/2 inches to a mile) or 1:50,000 (about 1 1/4 inches to a mile).

Topographical maps are available from M.A.P.S. B.C., Ministry of Crown Lands, Surveys and Resource Mapping Branch, Victoria, or from the Department of Mines and Surveys, Ottawa. Some stores that sell government documents also carry these maps. In many communities throughout British Columbia maps may be purchased directly or ordered through Government Agents offices listed in the telephone book.

Contour lines on topographical maps indicate elevation. If the lines are far apart this indicates a gentle slope. If the lines are close together this indicates a steeper slope or hill.

You can also use hand drawn maps prepared by yourself or other hunters you know. "Mental maps" are based on your memory of the direction and distances you have travelled. However, these should not be chosen over a good topographical map.

Compasses

Always take two compasses on any hunting trip: one to use and a spare in your survival kit. There are many types of compasses available. They range from a simple pocket compass which shows general directions, to complex models with sights and sighting lines, useful for drawing maps or navigating exactly to specific locations.

A pocket compass is satisfactory when you just need to know basic north, south, east, and west directions to find your destination. There are several types of pocket compass. The best of these has a liquid filled dial which slows the swinging of the compass needle and makes it easier to use.

Be sure to hold the compass horizontally and flat. Otherwise the needle may stick or show an inaccurate reading. The compass must be kept away from metal objects. Stand several feet away from any firearms, axes, or knives when taking a compass bearing. Even a metal belt buckle can distort the needle's action.

A compass needle always points to magnetic north. The difference between true and magnetic north is called declination. At present, in southern B.C. magnetic north is about 22 degrees east of true north. Declination is simply the angular difference between true north and the magnetic north shown by a compass needle. Most maps show direction relative to true north, so declination must be considered by using a map and compass.

Practice with your compass before you go on your hunting trip. The time to orient yourself using your compass, map, and landmarks is when you leave camp at the beginning of your day. If you wait until you are lost, it will be too late.

ORIENTING WITH THE POLE STAR

Find the pole star by following a line out from the lip of the big dipper. The distance is five times the distance between the two aligning stars of the dipper. Face towards it and you are facing north. Scratch the direction on the ground and you will be able to orient yourself in the morning.

(3) Survival Kit

A survival kit is important for every outdoor experience, from a walk in the woods to a week-long hunt.

The kit should be small and light so it can be easily carried with you at all times. The best kit will fit into a jacket pocket or waist pack.

Your survival kit should include:

Container - an empty tin or tobacco can, or a "tupperware" container, of a convenient size; a metal container may also be used for cooking; tape card showing "ground to air" signals inside the lid and tape the lid to seal the container

Matches - wooden, strike anywhere matches, water-proofed

Flint and Steel

Fire Starter Tablet - burns for approximately 6 minutes

Absorbent Cotton - excellent tinder

Knife - small pocket knife with 2 blades

Fishing Equipment - 2 spoons, 2 dry flies, 2 wet flies, 2 snelled hook, 4 lead split shot, 15 yards (4 m) monofilament line (10 lb./ 4 kg) test

Safety Pins - 4 assorted sizes

Needle and Thread

Nails - 4 assorted sizes

Pencil and Paper

Snare Wire - 3 yards (2.7 m) of copper or brass wire

Oxo Cubes - 2

Tea Bags

Signal Mirror - with signalling instructions

Tape - 3 feet (1 m) black electrician's tape

Candle

Metal Spoon

Foil Survival Blanket

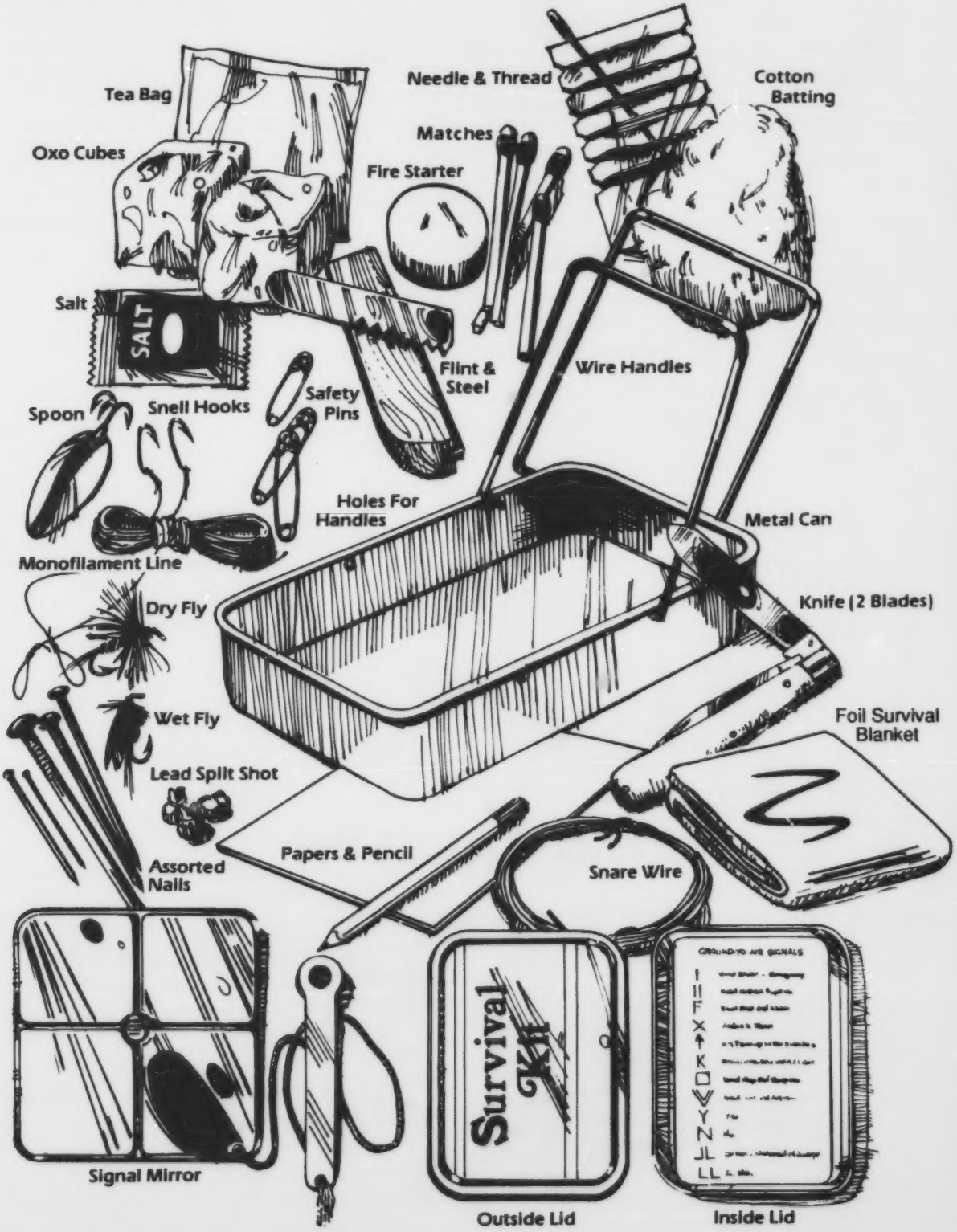
Plastic Whistle

Extra Compass

Signal Flares - small pencil type

Practice using each of these items before you take the kit on a trip, to give you confidence in the kit should you ever need to use it.

Survival Kit



(4) First Aid Kit

You should never go into the field without a first aid kit. The size and shape of the kit will depend on how it will be carried (backpack, jacket pocket, belt).

The kit should contain:

First Aid Handbook

Bandaids 6 to 12

4 x 4 inch (10 x 10 cm) Sterile Dressings

Butterfly Bandages 6 to 12

Triangular Bandages 2

Roll of Gauze Bandage 1 inch (2.5 cm)

Adhesive Tape

Petroleum Gel

Antiseptic

Razor Blade

Small Scissors

Tweezer

Small Mirror

Crepe Bandage

Aspirin

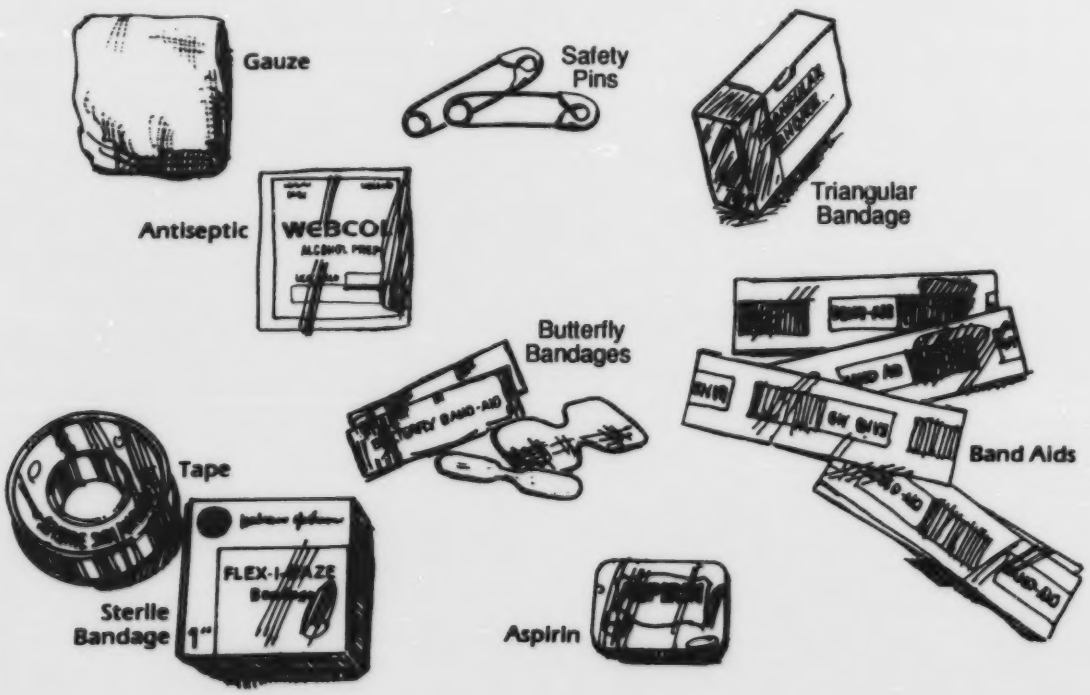
Safety Pins

Mole Skin

Antibacterial Soap

Change for telephone

Your family doctor may suggest that any needed personal medication be included in your first aid kit.



Tape the lid of the container to keep the kit watertight.

Your first aid kit, like your survival kit, should be completely familiar to you. Know what it contains and how to use each item properly. First aid techniques will be discussed later in this chapter.

(5) Firearm and Ammunition

These will be dealt with in Chapter 2.

(6) Other Equipment

Depending on the time of year and the length and location of your trip, you may need other types of equipment. Some items you may include are:

Sharp, strong knife or hand axe.

Cooking utensils

Stove, two-burner white alcohol or naptha gas

Food: freeze-dried and dehydrated foods are lightweight, easy to prepare and nutritious; take a variety.

Emergency food: high caloric content, e.g. nuts, chocolate bars, dried fruit, candy, sugar, and bouillon cubes, coffee, or tea

Tent: windproof, waterproof, strong, lightweight

Sleeping bag: down-filled or synthetic filled

Insolite sleeping pad

Extra socks and gloves, safety pins

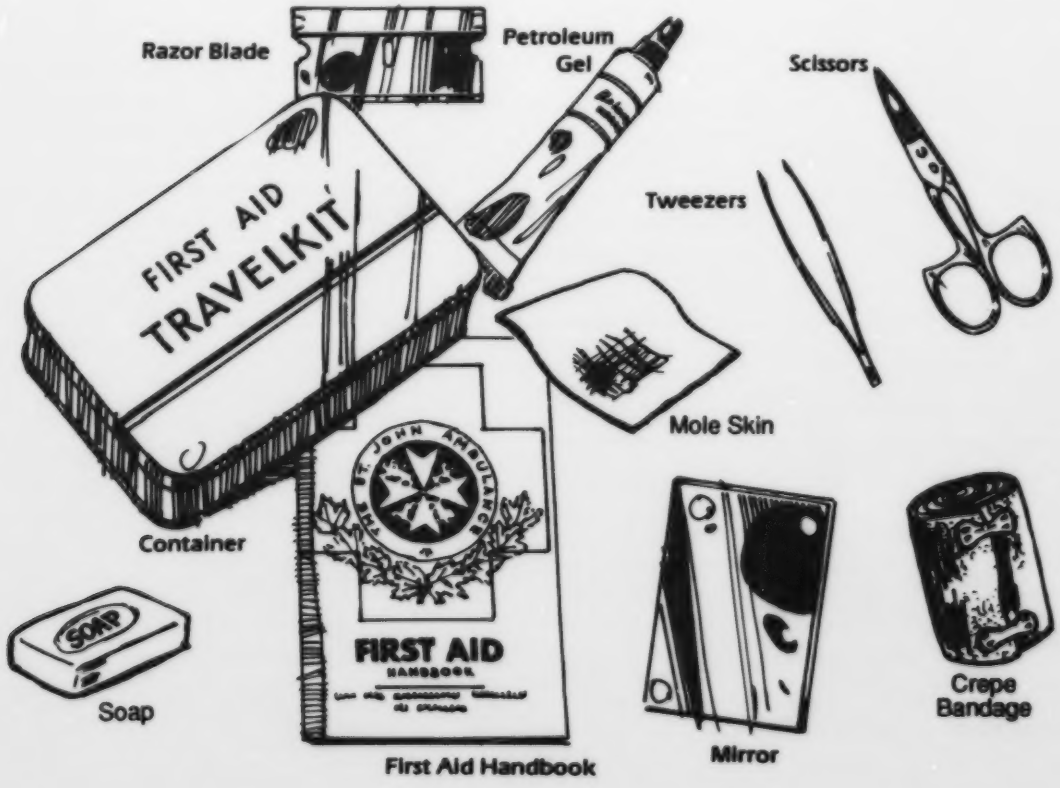
Several yards of light, strong rope

Sunglasses

Flashlight

Plastic sheet

Aluminum foil for a dish, pan, etc.



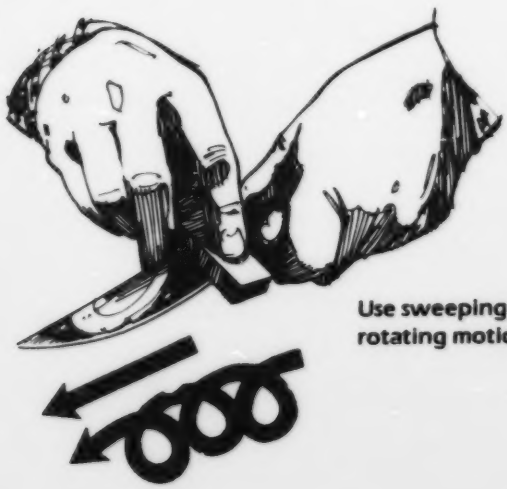
KNIVES AND AXES

Knives

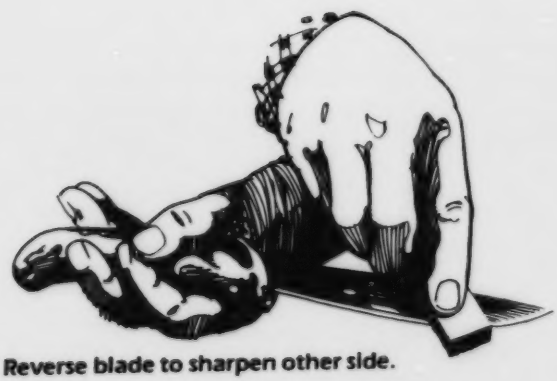
Some hunters prefer a sheath knife, others like a pocket knife. It is often wise to carry both when hunting in case one is broken or lost.

The blade of any knife should be of good quality steel so it will keep its edge for a reasonable time. With regular use around camp, a knife will need to be sharpened every three or four days.

Knife blades should not be used to pry, chop or bore holes.



Use sweeping or rotating motion.



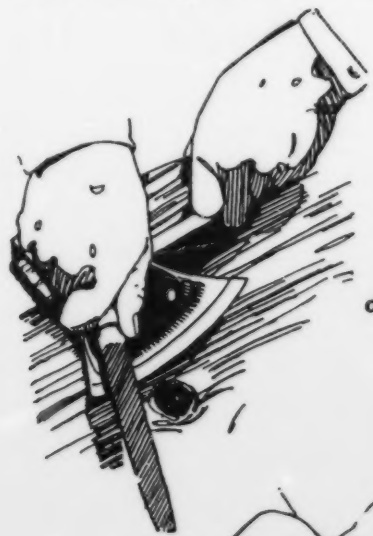
Reverse blade to sharpen other side.

Sheath Knife

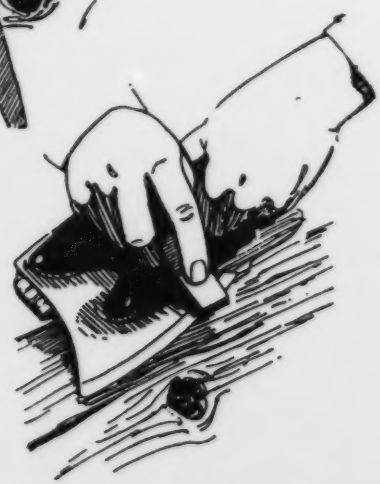
The blade of a sheath knife, to be effective for hunting purposes, should be no longer than 4 inches (10 cm). Longer knives are clumsy and not as versatile as a 4 inch (10 cm) blade which can be used for many chores such as butchering, skinning and whittling.

Sheath knives should remain in their scabbards at all times when not in use. The sheath, or scabbard, should be made of durable leather, reinforced at the tip with wire or copper rivets.

To keep your sheath in good condition, clean it with saddle soap, never oil. Saddle soap will keep the leather supple.



Use outgoing down stroke.



Use stone with same motion as file.

Pocket Knife

A pocket knife for hunting should have two strong blades, each between 2 1/2 to 3 inches (6 cm to 8 cm) long. A pen knife is not suitable for such use.

Pocket knives should be kept folded when not in use.

Sharpening a Knife

Knives must be kept sharp to perform their functions properly. Present day sharpening and grinding implements include a variety of electric-powered wheels and abrasive stones. Great care must be taken when using power equipment. In inexperienced hands, these grinders and sharpeners can do more harm than good. Most power sharpening and grinding devices produce a great deal of friction which generates very hot temperatures. Over-heating will "draw" the temper, thereby ruining the blade, which will never hold a keen edge again. There is a danger too, that an inexperienced person may grind away too much of the blade. The safest method for the average person is to use a sharpening stone. Keep the stone wet using a honing oil or any fine grade oil. Holding the stone in one hand and the knife in the other, keep the blade at about 30 degree angle to the stone. Start at the knife handle end of the blade and, in a sweeping motion, rub the stone against the blade to the tip. Turn the blade over and sharpen the other side. Maintain an even pressure and the same angle consistently throughout the sharpening process.

To test if the edge is completely sharpened, run the blade edge lightly over the tip of your fingernail. The edge of the blade should grab at the fingernail. If the blade slips at any spot on its edge, continue to rub the blade against the stone a few more times.

For a razor sharp finish to your blade, you can give it a final stropping on a strip of heavy leather rubbed with jeweller's rouge. Many sportsmen carry a sharpening steel with them to touch-up the edge on their knife between proper sharpenings.

Axes

The modern outdoorsman will find an axe is his most useful tool. Besides felling trees and chopping wood for fire and shelter, a well sharpened axe can skin and clean game and, if necessary, the steel axe-head can be used with a piece of flint to start a fire.

Selection of Axes

Axes come in different sizes to perform many different jobs. Axes are categorized as small, medium and large according to the weight of the axe-head and the length of the handle.

A camp axe is a small axe with a head weighing about 2 or 2 1/2 pounds (.8kg or 1 kg) and a handle between 20 and 28 inches (50 cm to 71 cm) long. It will chop small to medium size logs easily and can be used for bigger jobs if the edge is kept razor sharp. The camp axe takes up very little space and is ideal when horsepacking or when camping in small quarters.

No matter what size axe you choose, it should have a forged steel rather than cast steel head. Cast steel does not hold a sharp edge and breaks more readily than forged steel.

The best axes are made from high quality carbon steel which has been tempered to resist brittleness.

When selecting a wood-handled axe, be sure the grain of the wood is straight for the entire length of the handle. Hickory is considered the best wood for axe handles.

Care and use of Axes

Replace a cracked or splintered axe handle. Do not attempt to patch it.

When replacing a wood axe-handle, cut off the old handle as close to the metal head as possible. The remaining wood can be dug out of the eye of the axe-head in small pieces. Insert the new handle in the eye and tap it into place. Cut two hardwood wedges and insert them in the axe-head next to the handle. Drive the wedges in as far as they will go so the handle is seated snugly in position and is as tight as possible.

To protect the handle, rub linseed oil into the wood of the handle along its entire length using a soft cloth. Never varnish or paint an axe-handle. Painted or varnished handles can cause your hands to blister.

If an axe-head is loose, do not use it until it has been tightened. You can tighten a loose handle by driving the hardwood wedges in further to fit more snugly, or you can soak the axe-head in water which will cause the wood to swell and the handle will then fit more tightly.

In extremely cold weather, always warm an axe before starting to cut. Cold makes the metal brittle which could cause the axe-blade to snap.

When using an axe, always work on a chopping block. A stump or log makes a satisfactory chopping block.

Always be sure no one is standing in line with the swing of your axe. Be careful when using an axe to insure that the area of the entire swing is clear of all obstructions.

Sharpening an Axe

A dull axe is dangerous. A sharp blade will bite into a log, but a dull edge may glance off the mark and cause a serious mishap.

To sharpen an axe you will need a file, and if available, a vise. Place the axe-head in a vise with the blade up. Clamp the axe-head in the vise close to where the handle is inserted in the eye. Holding the file flat, file from the eye along the entire edge. File on the outgoing stroke only, maintaining the same pressure and the same angle throughout the stroke. Turn the axe-head to the opposite direction to file the other side of the blade. Be sure to file both sides evenly.

In the field, where a vise is not available, extend the edge of the blade over a log or stump and hold the axe-head securely with your knee or foot while you file.

To check if you have sharpened the blade evenly, sight down the edge. There should be a fine bur on the blade edge. If you notice any bright or white spots, file the edge again until these dull patches disappear.

A final rubbing with a fine emery stone will hone the edge to razor sharpness.

An axe should never be thinned, that is, ground or filed to a thinner shape than when it comes from the factory. Grind or file the axe in a fan-shape, leaving a little more metal at the corners. The cutting edge of an axe should be rounded, not wedge-shape. The rounded edge will throw wood chips outward, away from the blade.

An axe is the outdoorsman's most useful tool. Select a quality axe and care for it properly. Keep it sharp. Take proper care of the handle, keeping the head tight and the handle smooth. Never use your axe to drive or pound on anything more than a tent peg. Axes are not designed to be used as a sledge hammer or as a wedge and should not be used for these purposes. With care, an axe will give the outdoorsman years of useful service.

BACKPACKING

For a hunting trip lasting several days in bush or rugged mountain country, backpacking may be the only satisfactory way to carry all your gear and equipment.

Backpack is a term describing the whole apparatus carried on your back. It usually includes a bag or sack to contain your gear and a frame to hold the bag in position on your back.

The hunter should choose a sturdy, heavy-duty frame to carry his gear. Some experienced backpackers say young people under 14 should carry a pack of 30 pounds (14kg) or less and those in their older teens can carry a pack weighing 40 to 45 pounds (18 kg to 20kg). Other experts say the pack can weigh up to one-third of the carrier's body weight.

Packboards

Packboards are designed to rest easily against the back, allow freedom of movement and let air circulate freely between the pack and the back. Various loads or weight distributions can be arranged on packboard frames.

Most packboards have tightly stretched canvas or nylon webbing lashed between the vertical sides of the frame. The webbing serves as a sling to hold the pack. It cushions the load against the back and lets air in between the pack and your back to cool you.

Some modern packboards are made of welded aluminum or magnesium. These usually have an adjustable hip band attached to the lower part of the frame which supports most of the pack's weight. The hip band should be moved up or down to fit your body. It should ride above your hip bones and below your waist. If it is too low, it restricts the thighs when you lift your legs while walking, and that is tiring. If it's too high, you use muscle instead of bone to support the weight, and that hurts. The hip band should be padded. Most manufacturers offer three lengths of frame. Be sure to buy the proper size.

To carry game and other heavy loads, many hunters use a "Trapper Nelson" frame, a simple packboard made of heavy canvas stretched between wooden sides with a detachable bag. The load is strapped to the wooden sides which are about one to two inches thick. Shoulder straps hold the pack in place. Only the canvas fabric touches the carrier's back.

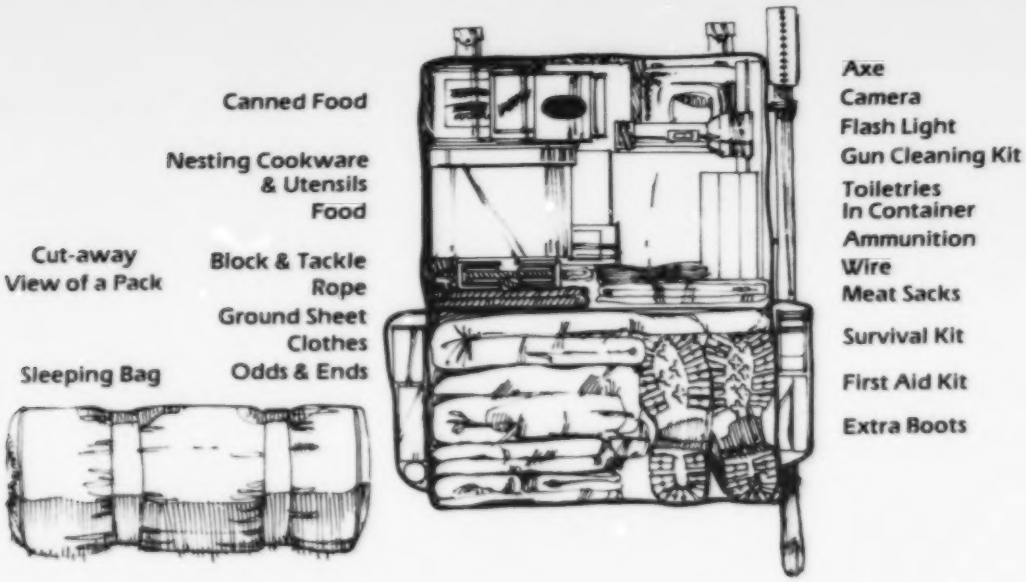
Those who use a "Trapper Nelson" claim it holds loads closer to the body than other packs and puts the main carrying effort directly on the hips and legs rather than on the shoulders and spine.

Many backpackers use a tump line for carrying extra heavy packs. The tump line fastens to both sides of the packframe. It has a foam-padded head rest in the centre of the line which lays against the carrier's forehead. This takes some weight off the shoulder straps making heavy loads easier to carry.

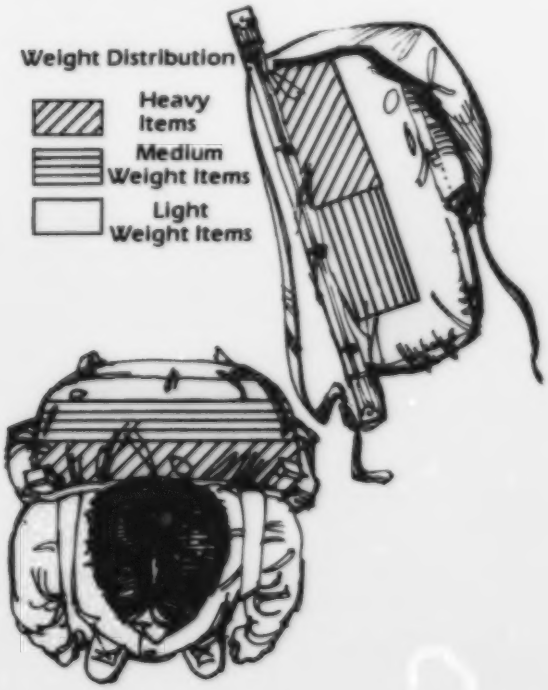
Packsacks

The sack should be flexible in design so weight distribution can be varied. Gear to be carried for a short one-day hike and that carried for a trek lasting several days through heavy bush country, will be packed in different ways.

Generally, lighter items will be packed at the bottom of the sack with heavier gear near the top so most of the weight is near the top of the shoulders and close to the body.



The pack should hang so it does not pull back on the shoulder straps. When the weight is properly distributed, there is an upward thrust from the hips and legs and a lift and pull from the shoulder harness while walking. The weight of the pack should be supported evenly by the back, shoulders and legs.



The support and shoulder straps should not restrict the movements of the back or arms. The straps should slide freely on the lift bars. This motion will act as a shock absorber if you slip or fall.

Correct weight distribution will also permit a constant flow of air between the pack and the carrier's back. Very heavy loads should be balanced so the center of gravity is high and close to the shoulders with heaviest objects as close to the body as possible. This is the way to carry game or a heavy trophy head. When carrying game heads on a packboard, they should be flagged with blaze-orange ribbon.

Backpacking Trips

The hunter who plans to backpack should make up his pack ahead of time. Check the pack's weight and get the feel and balance of it. Then practice carrying it before starting out.

Know your weight limit. Know the weight you can carry under specific conditions such as rough ground and hilly terrain,

high altitude, hot or cold weather conditions, and your physical condition—and adjust your pack weight accordingly.

The only items a backpacker should carry in his pockets are those things required from time to time during the day such as a compass, pocket knife, waterproof match box, watch, and handkerchief.

The beginning backpacker should plan to spend three or four days getting acquainted with his pack, his equipment and his ability to handle it.

To Put On a Pack:

a) Lift the frame onto your thigh.

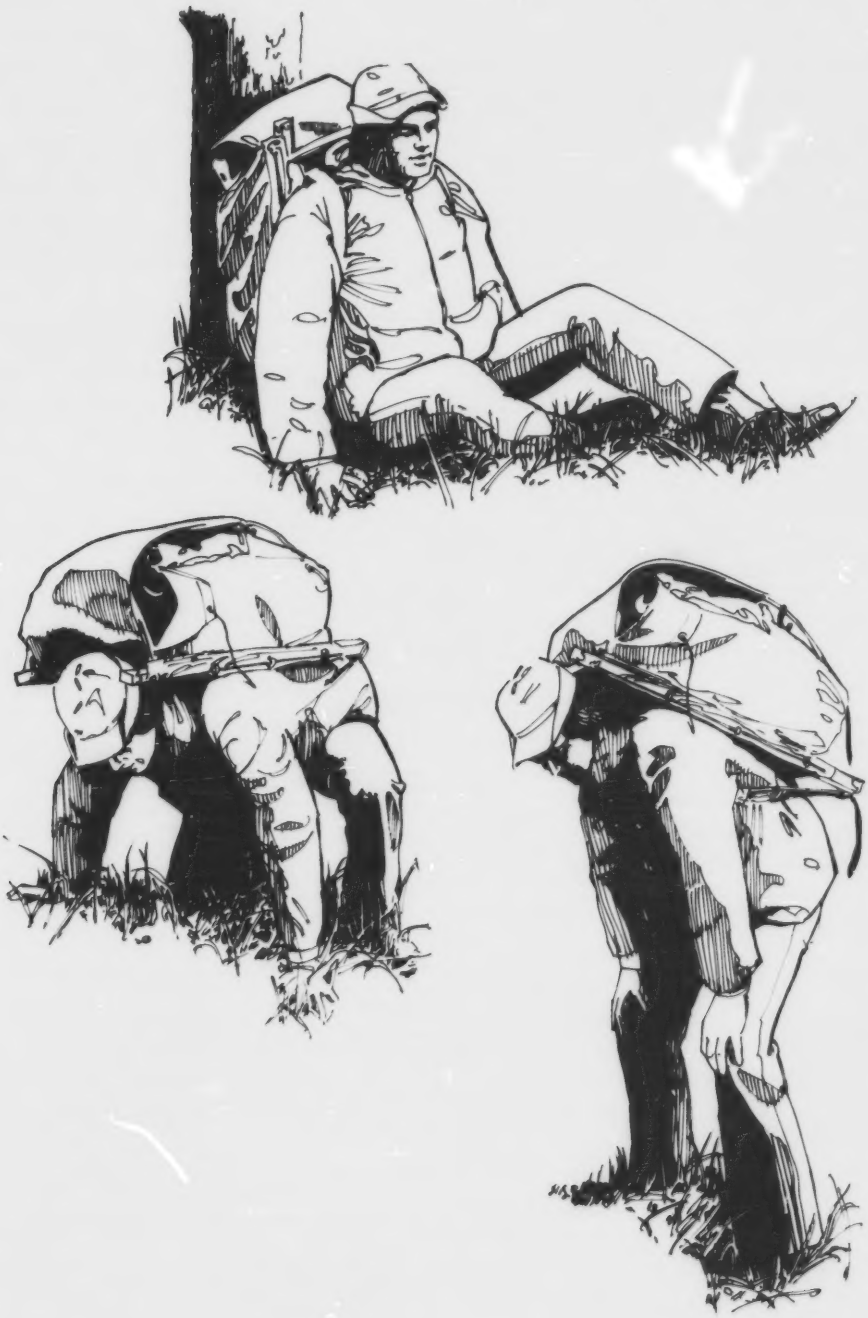
b) Put the right arm through the shoulder strap and reach down to grasp the lower corner of the frame.

c) Lift the frame high and to the left with your right hand, then put your left arm through the left strap.

d) To get up with a very heavy load, lean the pack against something so it sits upright. Sit down and put shoulders in the straps. Tuck one foot under the other leg and fasten hip band loosely. Roll onto hands, knee and foot in the same motion, stand up. Once up, hunch the shoulders to raise load and tighten hip band.

To Take Off a Pack:

If you cannot readily swing out of the loaded pack frame harness, sit down and rest the frame on the ground or on a large rock and then slip out of the harness.



3. Practice Safe Behaviour

There are three main areas where you can add to your safety:

(1) plan your trip;
(2) act with caution;
(3) know where you are; and
(4) hunt with a partner.

(1) Plan Your Trip

Be prepared by planning and taking the right equipment.

Tell someone where you are going and when you expect to return. Leave a map of your expected route with a friend. Leave clear instructions of what to do if you do not return. Leave your vehicle in sight when you park it. Leave a map of your route in the vehicle so a rescuer can see it through the window.

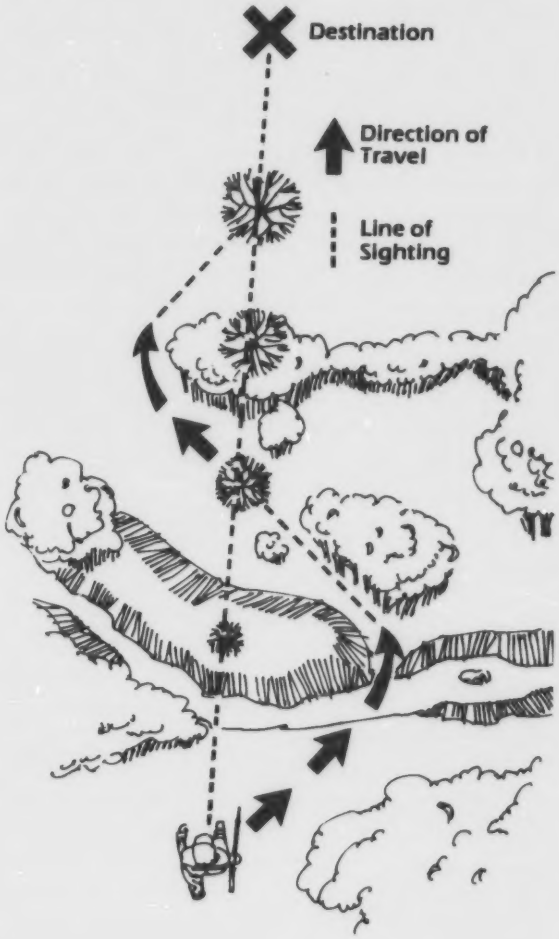
(2) Act with Caution

When walking through bush or along dusty or graveled roads, twigs, burrs and small stones can collect in your socks and boots. Such bits of dirt and debris can rub and irritate your skin causing painful sores and blisters. Remove your socks and boots occasionally and shake out any objects picked up on the trail.

Be alert on the trail. Avoid areas with poor footing. Test footing on fallen logs, dead bark, or rocks in streams. Watch for dew or frost, it will make your footing unsafe.

Don't walk in the dark. Plan to be back at your camp at least one hour before dark.

Go slowly, rest often. Don't walk if you are too tired. Carry sharp tools such as knives or axes in a protective sheath. If you fall there is less likelihood of being cut.



(3) Know Where You Are

When you set up camp, orient your map so the landmarks on the map line up with the landmarks nearby. Note all visible landmarks as reference points. Lay your compass on the map and identify landmarks in relation to their compass direction.

Use your compass as you leave camp and to get you back to camp. For example, if you decide to hunt deer in a nearby range of hills, take a compass reading before you leave camp. If the compass showed the direction of the hills as south-west of camp,

you know that after hunting in the hills you must walk north-east from the hills to get back to camp. Check your direction at intervals along the way.

If you walk some distance after reaching the hills take this into account when you return. You can follow the compass directions back to the general area where you began, then look for landmarks to get back to camp.

When your camp is near a "base-line" such as a river, road, or ravine, you can easily find your way back with a compass. If you are hunting north of the base-line all you must do is walk south to the base-line and you will be in line with your camp.

Bear and Cougar Safety

Bears and cougars usually avoid people but they may attack if they are provoked, hungry, or startled.

Always hunt with a partner. When you are on the trail, watch for signs of bears such as droppings, markings or tracks, or their strong scent.

Be wary near berry patches or the banks of streams where fish are spawning. Never approach a fresh kill.

When not hunting use a noisemaker, such as a bell or tin can containing a few pebbles. Attach it to your walking staff or pack. The human voice is an unfamiliar sound in the wilderness, so talking or singing are effective. Be extra careful in thick bush.

Be particularly careful in high winds, when an animal may not be able to hear you or be able to pick up your scent soon enough to avoid you. If you see a bear at a distance, make a wide detour or leave the area at once. If you cannot make a detour or retreat, wait until the bear moves away from your path—always leave the animal an escape route. Do not store or cook your food in your tent in camp. Store your food and game meat away from camp, preferably out of a bear's reach.

Female bears with cubs are especially dangerous. Never approach a cub, even if it seems to be alone, and never get caught between a cub and its mother.

If you meet a bear, it will most likely move away. However, bears can be unpredictable. Learn to recognize the signs of a bear attack, and above all don't panic.

The sign of a probable attack are growling, with ears laid back. A bear rearing up on its hind legs is probably taking a more careful sniff to make certain of who you are.

Running, waving of the arms, and throwing sticks or stones may only provoke a bear.

If you meet an aggressive grizzly in a wooded area, speak softly and back slowly toward a tall tree and climb as high as you can. Grizzlies don't usually climb trees, but they can easily reach up to 10 feet.

If you are attacked, protect your stomach, thighs, and neck by lying down on the ground in a hunched position with knees drawn up to your chest and hands clasped over your neck. Wearing your pack will shield your body. The bear may try to maul you, but will do less damage if you can lie still. Resistance is useless. Usually the bear will retreat immediately after the attack.

II. DEALING WITH SURVIVAL SITUATIONS

Survival situations fall into three general categories:

1. Being lost or unable to get back to your camp;

2. Falling through ice or into water; and,

3. Injuries which require first aid or medical attention.

Each of these situations requires you to be able to assess the situation and choose the best action to deal with it. The greatest threat to survival is in the mind of the individual. Survival depends largely on mental attitude. You should practice survival techniques before you go hunting. Practice will make you familiar with equipment and techniques for survival. It can also give you confidence and lessen your emotional stress if you are in a survival situation.

In a survival situation you must first treat injuries, then deal with other survival practices.

1. So You Are Lost

A survival situation usually lasts less than 72 hours and seldom longer than five days. Searches can take time, however, and you will need to rely on your own resources to survive until help comes. If lost, the trip information or plan left at home or camp will now make a positive difference toward being found quickly.

You must deal with your state of mind and your physical comfort. To do this you must know about:

(1) staying put
(2) composure and first aid
(3) fire building
(4) shelter building
(5) rescue signals
(6) food and water

(1) Stay Put

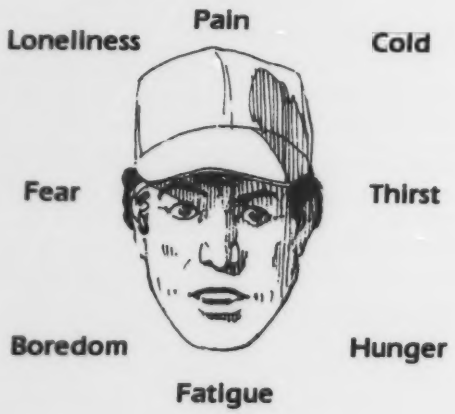
The greatest mistake a person who is lost can make is to start wandering in an attempt to find a way back to camp. If you become lost, set up a survival camp and stay put.

Your fire and other signals will help others find you. If you use a sound signal and hear a reply, don't try to find your rescuer, wait for them to follow your signal to you. If you keep moving around there is less chance they will find you.

Never travel at night. You may fall into a hole, trip, or step onto something sharp and injure yourself. You will only add to your problem if you travel at night.

Attend to your injuries if any, build a fire and shelter, and stay put.

(2) Composure



There are eight main factors that affect your survival. These are pain, cold, fatigue, fear, hunger, thirst, loneliness, and boredom. You

can overcome these feelings if you know how to deal with them.

Pain

Pain is the body's way of telling you that something is wrong. Attend to any injuries immediately using the appropriate first aid treatment.

If your mind is busy making plans to cope with your situation, you will feel less pain and may even forget about it for a while. If you give in to the pain, you might stop trying to survive.

Cold

Cold is a serious threat to survival. A victim of cold often loses the ability to function normally. When you are very cold, it's hard to think about anything other than becoming warm.

To survive in the outdoors you must find ways to maintain your body temperature by staying dry, building a fire, and making a shelter to protect yourself from the weather.

Fatigue

When you are tired you do not think clearly and can become careless. Extreme fatigue can even destroy a person's desire to survive.

Overexertion, lack of sleep, and boredom may contribute to fatigue. Rest as much as possible and avoid over-exertion. A comfortable shelter will help you sleep.

Fear

Fear is a normal reaction: everyone feels afraid when they are lost. Fear affects the way you behave and, if not overcome, can become your greatest obstacle to survival.

The best way to deal with fear is to try to think through why you are afraid and use common sense to deal with and overcome each particular fear you may have. Keep occupied and improve your condition with what is at hand.

Hunger

Though hunger will make you feel uncomfortable, it is not a serious factor in most survival situations. Your body fat will normally supply enough energy to enable you to survive 30 days or more.

Thirst

Don't worry about how thirsty you are. You can survive for several days without water if you are in normal health.

Keep your mind active and busy with plans for coping with the situation at hand. Later, you can locate water near your survival camp or collect it.

Boredom and loneliness

Boredom and loneliness can occur while waiting to be rescued. This may cause you to act irrationally, which can create problems.

To overcome boredom and loneliness you must try to adapt to your situation and improvise solutions to problems. Think positively and plan ways to overcome problems. Tolerate solitude. Avoid panic and keep calm. Be patient. Keep your hands busy by doing things such as improving your camp.

(3) Fire Building

Fire is a basic need for survival. With a fire you can warm yourself, dry clothing, signal for assistance, cook a meal, and enjoy a safe and comfortable night. Fire provides security, comfort, and has a way of putting

fear and apprehension out of your mind. Always carry the means to light a fire when you are hunting.

To build a fire you will need fire-starters, fuel, and a safe location.

Fire-starters

The most practical matches are the long wooden "strike anywhere" variety. Keep these in an unbreakable, waterproof container.

Fire-starting cubes are also excellent to help ignite your fire. Always light your fire from the upwind side.

Fuel

You need two kinds of fuel to start a fire—tinder and kindling.

Most fires will not burn without first lighting some easily flammable tinder. In forest areas, you will find tinder readily available. Gather the fine dead twigs from the lower limbs of standing trees or from dry windfalls for tinder.

On the coast it may be difficult to find something dry enough to burn. The core of small, easily broken standing snags may provide dry fuel even in the dampest conditions.

Gather a good supply of firewood for the night: a good estimate is to gather twice as much as you think you will need. Be careful that you do not smother the fire by adding too much fuel.

Fire location

Carefully select the location of your fire pit. Do not build a fire under a tree; the tree may catch fire. The heat from the fire may also melt snow on the tree's branches, soaking the fire and putting it out.

If you must build a fire on snow, construct a platform on the snow made of green logs or stones.

If the ground is dry as it is in many parts of the Interior, scrape away all grass and debris and build the fire on bare dirt to avoid starting a grass or forest fire. Beware of exposed tree roots; they can catch fire quickly.

Be sure to shield the fire from the wind and use a rock or wall of logs to reflect the heat towards you and your shelter.

(4) Rescue Signals

Once you have attended to any injuries and a fire you can try and attract the attention of other people. There are five types of signals that you can use—fire, flare, mirror, sound, and information signals. In general, three repetitions of any signal indicates distress.

Fire signals

Fires make excellent signals. A large bright fire at night or a smoky one during the day

can be easily seen. Green boughs produce intense smoke when burned, but don't smother your fire when using them. If you have enough fuel you can set three signal fires to appear as a triangle from the air.

Flare signals

To attract aircraft, flare signals are best. Flare cartridges are available which can be fired from a rifle or shotgun. Also, small flare signalling devices may be purchased and included in your survival kit.

Mirror signals

A mirror rotated to reflect the sunlight is an excellent device for attracting attention. Move the mirror at an angle to produce flashes of light.

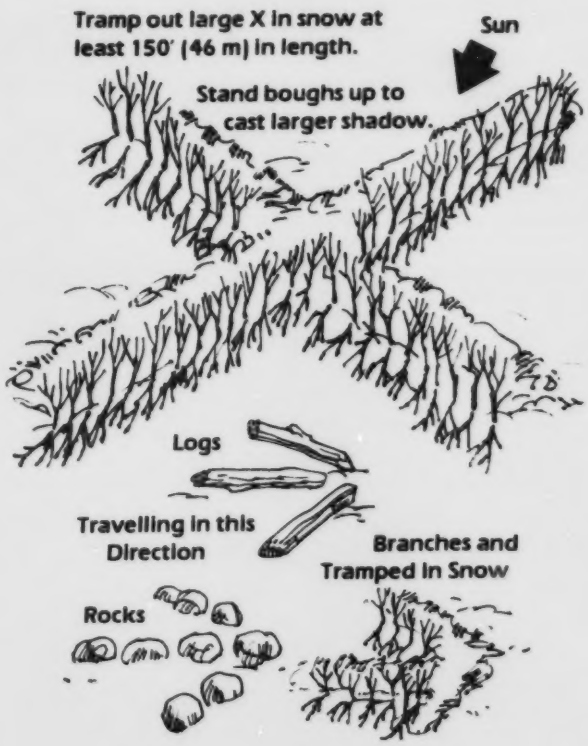
Sound signals

Carry a shrill whistle. It has a loud, distinctive noise and will carry much farther than your voice. Blow three blasts as a signal.

Carefully consider using your firearm to attract attention. Gunshots can be a confusing signal as others may think you're shooting at game and ignore your signal shots. However, if you are very seriously injured, fire your ammunition off in groups of three shots, with 10 seconds between each shot. Wait 10 to 15 minutes for an answering signal shot. Repeat this procedure as long as your ammunition supply will allow, but don't use up all your ammunition.

Information Signals

Your best chance of survival is by staying put at one location. In addition to a fire, you can make a large X or an SOS in a clearing near your camp. Use heaps of stones or earth, piles of brush, tree branches or trampled grass or snow.


Tramp out large X in snow at least 150' (46 m) in length.
Sun
Stand boughs up to cast larger shadow.
Logs
Travelling in this Direction
Branches and Tramped in Snow
Rocks

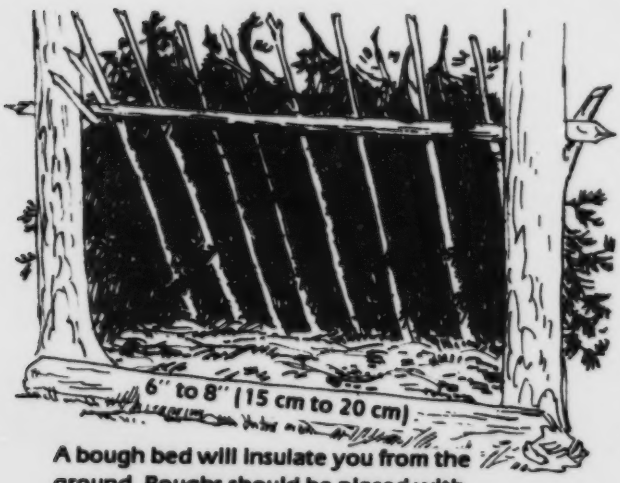
If, after very serious consideration, you decide to leave your place of shelter, be sure to leave a message indicating the direction you're going. Make a large arrow on the ground from any available material so that search aircraft or ground searchers will know which direction to look. Ground searchers will also be guided by such signals. If possible, leave a note explaining where you are headed and what time you left camp.

(5) Shelter Building

Choose the most protected spot you can, and set up a warm, established camp to give yourself a psychological lift. Shelters should be simple and small. It is vital that you stay warm when lost or stranded. Your shelter should protect you from the wind and cold, and keep you dry. Build the best shelter you can without wasting energy. A sheet of plastic taken along on the trip is invaluable in building a shelter.

There are three basic types of shelters—natural shelters, lean-to or tent structures, and snow caves.

Natural shelters such as fallen trees or overhanging rock ledges are good if they are well secured. A fallen tree can provide a quick and easy shelter. Cut away some of the non- supporting branches and lean them against the trunk to form a crude roof. If you use a cave make sure it is not occupied.



A bough bed will insulate you from the ground. Boughs should be placed with broken ends toward the ground.

A lean-to or tent structure can be improvised from a variety of materials including slabs of wood, split wood planks, evergreen boughs, and sheets of plastic. Make a bed of boughs about 8 inches (20 cm) deep to insulate you from the ground.

Snow caves are difficult to dig without getting wet. They can keep you warm, however. Make it deep enough to sit in and long enough to lie down. Make the roof arched so moisture will run down the walls and not drip onto you. Leave a ventilation hole in the roof and keep it open with a stick.

(6) Food and Water

Water and food are not as critical as they may first seem. You can survive for several days without water. Locating water is generally not difficult in British Columbia.

You need 2 to 3 quarts (2.27 to 3.41 litres) of water every day. Drink even though you may not feel thirsty. Drink as much as possible whenever it is available. If your water supply is limited, restrict your activity and movement, especially during the heat of the day.

If possible, boil or filter water before drinking it. Melt snow or ice over a fire; don't melt it in your mouth as this will cause dehydration and loss of body heat.

Food is not an immediate necessity for survival. If you are in normal health you should be able to exist for 30 days or more. However, once other survival needs are taken care of, you should spend some time gathering food from the wild to ward off hunger. This activity will also help dispel boredom.

Almost all plants yield some nourishment from their fruit, bark, or roots. Avoid mushrooms, however, since some are poisonous. There is often more food value or energy in meat from wildlife than in plants.

2. Ice and Water

Ice and water can create survival situations.

Ice

Stay off ice that has formed on salt water, tidal rivers, or fast-flowing streams. Never cross ice that is cracked, snow covered, or less than 4 inches (10 cm) thick.

If you must cross ice, carry a long pole or have a knife handy. If you break through ice you should:

- extend your arms flat on the ice surface and kick your feet to the surface of the water,
- hold a pole so it distributes your weight so you can climb out, and/or
- use a knife to dig into the ice surface to help you climb out.

If someone else breaks through, don't run to help him. Lie flat and extend a pole, scarf, or other object to him so he can pull himself out.

Once out of the water, roll in the snow. Snow will act as a blotter and soak up the water from your clothes. Build a fire on shore immediately; warm yourself and dry your clothes.

Water

Never swim alone, after dark, when you are tired, or after a big meal.

Never dive into water without first checking the depth. Wear a life jacket in boats.

If you fall in or if your boat capsizes get out of the water as quickly as possible. You can climb onto the boat since it will float even if capsized. If you can't, remain still, and curl up to retain heat. Wait for help.

If you fall into a fast moving stream, swim with the current and angle towards the shore.

If someone else falls into the water, throw her a rope or something that will float. Don't jump in after her or give her your body to hang on to.

PREPARATION REVIEW

1. List ten items that should be included in your survival kit.
2. List ten items that should be included in your first aid kit.
3. Describe 3 ways you can prepare yourself before hunting.
4. How does a compass work, and how can you use it to relocate your camp? for a hunt?
6. What are 2 safety actions you can take before going hunting?
7. What 6 things should you do if lost?

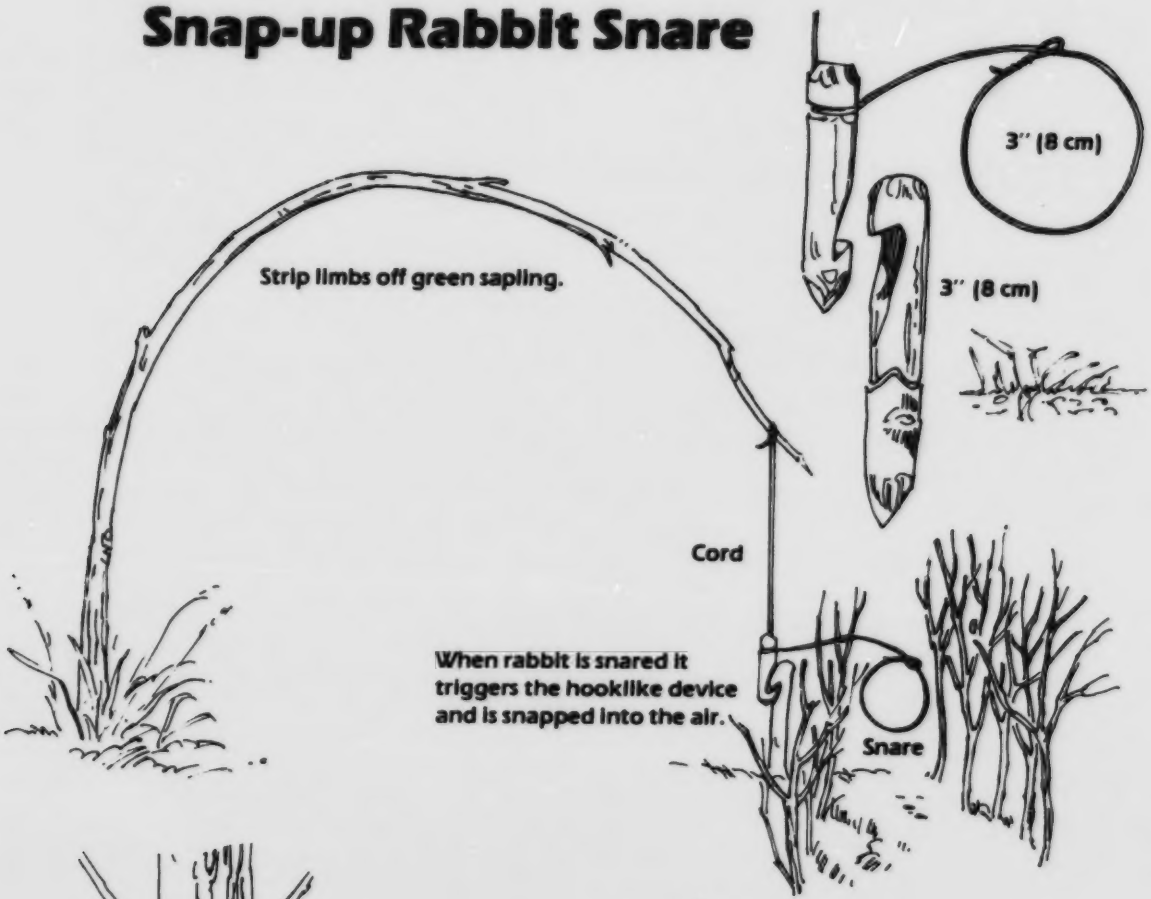
SURVIVAL - SUPPLEMENTAL

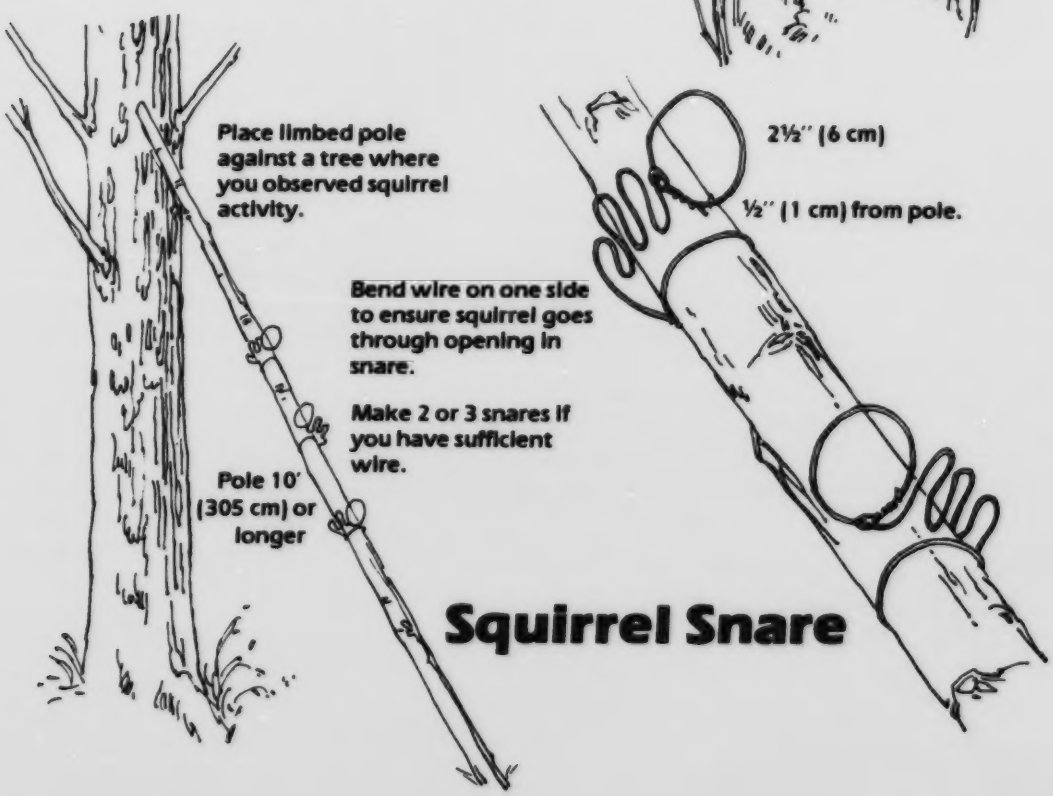
Animals as Survival Food

All animals and fish in British Columbia are edible and will provide excellent nourishment. They should be boiled and eaten as a stew or soup to maximize their value as food. You can obtain animals for food by shooting, spearing, snaring, trapping or hooking them. Special skills are required to trap animals and catch fish.

Remember, traps, snares and set-lines for fish work for you 24 hours a day whereas hunting does not.

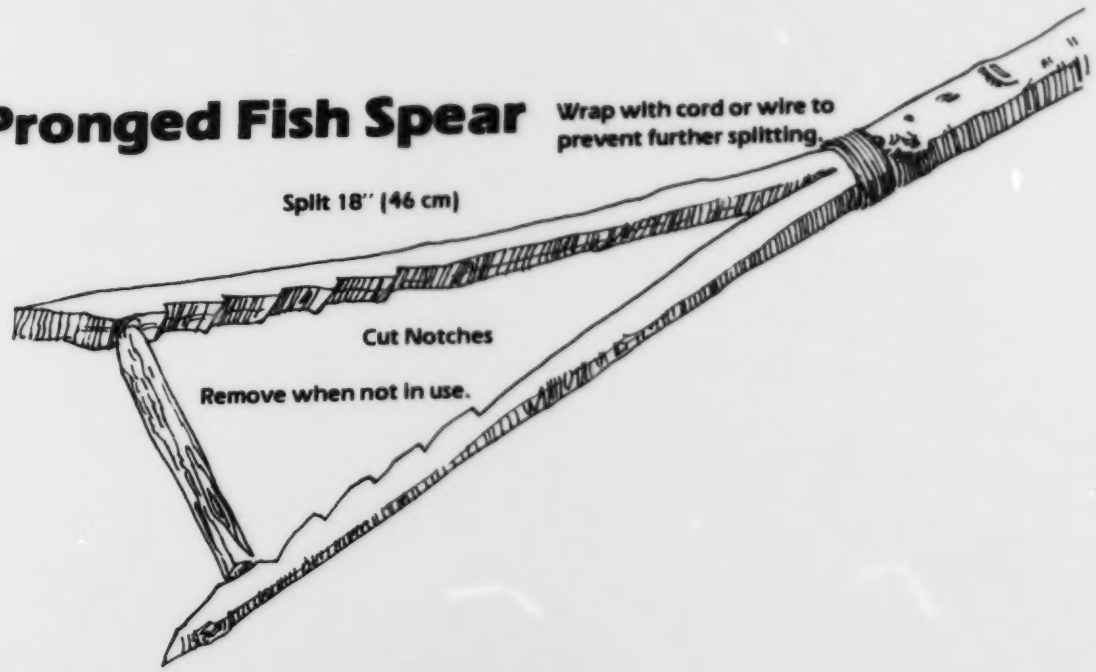
Snap-up Rabbit Snare


3" (8 cm)
3" (8 cm)
Strip limbs off green sapling.
Cord
When rabbit is snared it triggers the hooklike device and is snapped into the air.
Snare

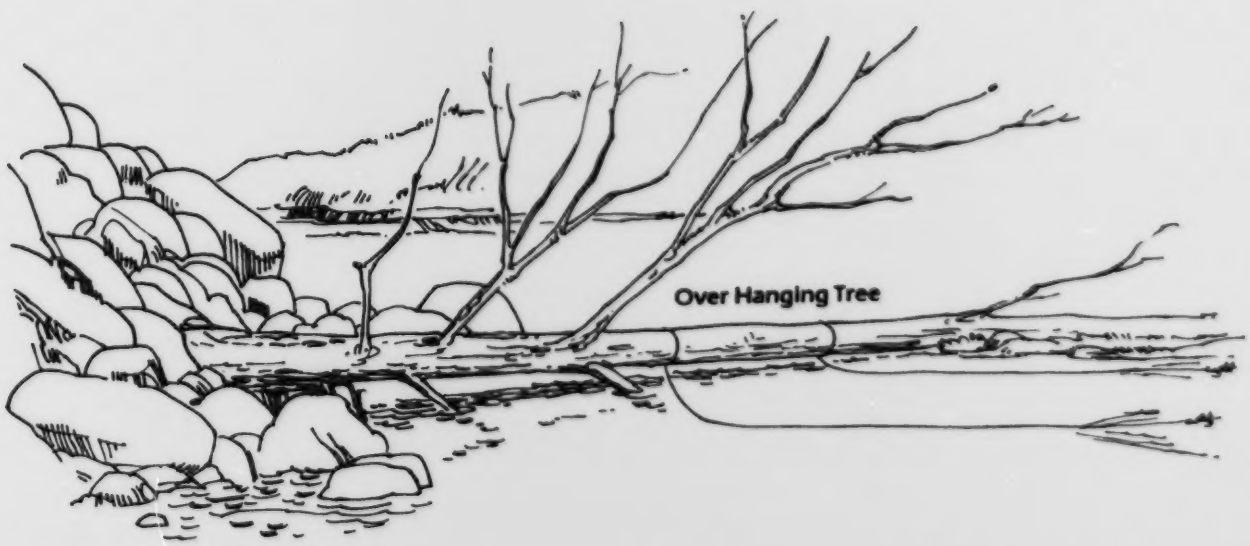

Place limbed pole against a tree where you observed squirrel activity.
Bend wire on one side to ensure squirrel goes through opening in snare.
Make 2 or 3 snares if you have sufficient wire.
Pole 10' (305 cm) or longer
2½" (6 cm)
½" (1 cm) from pole.

Squirrel Snare

Pronged Fish Spear



Set Lines for Fishing



3. First Aid

What is first aid?

First aid is emergency treatment to save life, prevent further injury or relieve suffering until the services of a doctor can be obtained. You must use whatever materials and facilities are available at the time and place of the injury: this is why you always carry your first aid kit.

First aid does not take the place of proper medical attention, but it can help save lives and prevent further injury. It is important to know what NOT to do, as well as knowing what to do.

The information presented here falls far short of a complete guide to first aid and is better described as "emergency aid". You should take a comprehensive first aid course to be prepared for an emergency situation.

Objectives

The objectives of first aid are:

(1) to preserve life

(2) to prevent the condition from becoming worse

(3) to relieve pain and promote recovery.

There are three basic elements to first aid:

(1) **Protection**: The patient must be protected from further harm or complication of his or her injuries while medical aid is sought.

(2) **Diagnosis and Treatment**: Certain injuries demand immediate attention; these must be treated without the delay of waiting for a doctor.

(3) **Movement**: Where it is necessary to transport the patient, this must be accomplished with a minimum of danger and discomfort.

(1) Protection

The first thing to do is be sure there is no further danger to the victim or to yourself. Be calm, and reassure the victim. The emotional stress of an emergency situation is often the greatest barrier to a well-planned first aid operation.

Fear, anxiety and panic are often the reactions of those involved in emergencies. If you are frightened or upset, you will make the victim even more excited or afraid.

Be as soothing and cheerful as you can. This attitude will calm the person who is hurt or sick and make him or her feel they are being well taken care of until the doctor arrives.

Carefully observe the surroundings and circumstances of the accident. Wherever possible, remove any danger (e.g., an overhanging log, etc.) rather than moving the victim. Be careful not to put yourself in danger while trying to help.

If a person appears seriously injured, don't try to move him. If you don't know exactly what the injury is, keep the victim lying down with his head level. Don't move the victim unless he is in obvious danger.

(2) Diagnosis and Treatment

Initial Examination Procedures

Examine the victim quickly using the following procedure:

(1) Calm yourself and reassure the victim.

(2) Check for and immediately attend to:

- Breathing
- Bleeding
- Shock

(3) Assess for further injury or illness.

Talk to the victim and ask where it hurts and what happened. Caution him not to move. If the victim is unconscious watch for any breathing problems, and place the victim in a recovery position. This is on the stomach with face turned to one side and one leg bent.

(2) Locate all wounds and stop bleeding.

(3) Check for lumps on the head.

(4) If the victim is conscious, ask where it hurts and what happened.

(5) See if the victim can raise his or her head or move their neck—if not, do not move the victim.

(6) If the head, neck, and spine are okay, check the arms and legs.

(7) Check for spinal injuries by running your hand firmly down the back to detect tenderness or pain.

The recovery position

Do a full head-to-toe examination. Look and feel for any abnormalities, lumps, deformities, fluids, and bleeding. Talk to the victim during your examination.

Check vital signs including speed and strength of pulse, eye movements, and skin temperature.

General Examination Procedure

You must examine a victim quickly. Use these seven steps.

(1) Check to make sure the victim is breathing.

Treatment of Specific Conditions

Three conditions must receive *immediate* attention. These are:

- Breathing
- Bleeding
- Shock

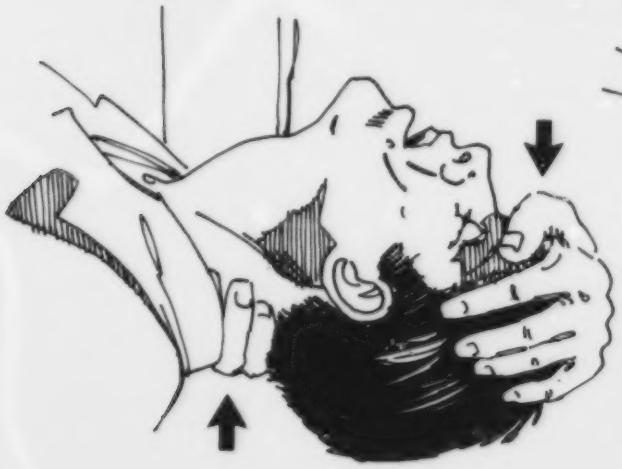
Breathing

There are many causes of breathing disruption. Whatever the cause there is an urgency for treatment since the victim will

suffer permanent brain damage or death after a few minutes without oxygen. Start artificial respiration immediately, and if in doubt continue until medical help arrives.

Artificial respiration

To begin mouth to mouth artificial respiration, and if a fractured neck is not suspected, gently tilt the victim's head back.



Pull the jaw upwards and forward into a jutting-out position. If you see anything in the victim's mouth that may obstruct the air passage, clear it out with your fingers.

Open your mouth wide and take a deep breath.

Place your mouth over the victim's mouth forming a tight seal.

Pinch their nostrils closed with your fingers and blow into the mouth only hard enough for the chest to rise.

Take your mouth away, turn your head to the side and take another deep breath and repeat the blowing procedure every 5 seconds.

Don't stop until the victim starts breathing on their own, or another person relieves you.

Bleeding

(a) External Bleeding

Cuts are a common injury usually resulting from accidents with tools such as axes, hatchets and knives.

Bleeding from most cuts can be stopped by pressing firmly on the cut with a thick cloth pad. Press the pad firmly, directly over the wound and hold it there until the bleeding stops. Keep pressing for at least five minutes.

Do not dab at the cut and do not keep looking to see if the bleeding has stopped. If you release the pressure too soon the bleeding will start again. If the dressing becomes soaked, don't remove it. Add another on top and increase the pressure.

If the cut is on an arm or leg, keep it elevated if possible to help stop the bleeding. Have the victim lie down.

If blood is coming in spurts, it means an artery has been cut. Bleeding from an artery can cause death in just a few minutes if it is not stopped quickly. To stop bleeding from a severed artery, use firm direct pressure over the wound.

If the cut is in the lower arm, blood flow can be controlled by applying strong pressure against the bone on the inside of the arm, halfway between the elbow and shoulder. If the cut is in the leg, blood flow can be controlled by applying strong pressure against the bone in the groin area.

Do not put antiseptics or alcohol in a wound. Although these products do kill germs, they can also destroy tissue which could delay healing.

Do not remove any embedded objects as this could lead to further damage and bleeding. Protect the wound by making a "donut"-shaped bandage surrounding it.

Once the bleeding has stopped, the area around the wound should be cleaned. Wash around the wound with clean water and soap. Be very gentle or the bleeding may start again.

After the wound has been carefully cleaned, apply a sterile bandage or gauze compress and hold it firmly in place with adhesive tape.

As a precaution against serious infection, anyone planning a hunting or camping trip should receive an anti-tetanus toxin injection before starting out.

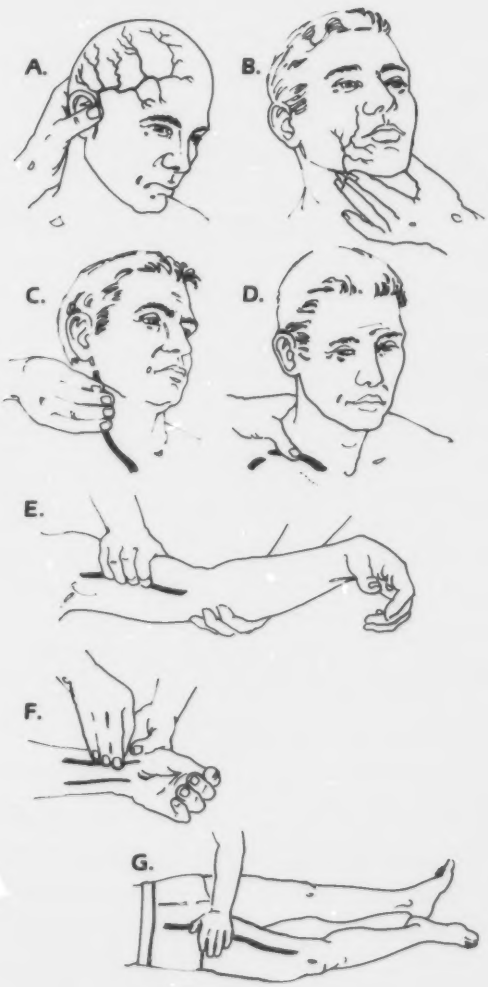
Tourniquet

A tourniquet should be used only when bleeding is so severe that the victim's life is endangered, and direct pressure on the wound is ineffective. Tourniquets often do more harm than good, and can result in the loss of a limb.

Never use wire or string to make a tourniquet; use a belt, strips of cloth or a rolled handkerchief. The tourniquet can be used effectively only over a single bone as found in the thigh or upper arm. It should be as close to the wound as possible and between the wound and the heart.

Insert a stick in the knot of the cloth or belt and twist to tighten the tourniquet. It should be tight enough to stop the bleeding but not so tight that it cuts off all blood circulation.

Main arterial pressure points to stop bleeding.



(b) Internal Bleeding

Internal bleeding may be suspected from the history of the accident (e.g., crushed by a log) and symptoms such as thirst, paleness, loss of consciousness or rapid, laboured breathing. Bleeding from natural openings may also be visible and pulse may become weaker and more rapid.

Keep the victim in the recovery position.

Watch for changes in symptoms such as choking or difficulty breathing.

Transport the victim to a hospital and report that you suspect internal bleeding.

Don't give any fluids or anything else by mouth, even if requested by the victim.

Sucking Chest Wound

This may be caused from the fracture of ribs into the chest cavity with resulting damage to the lungs. Air sucks in and out with each breath. This condition often results from gunshot wounds or falls and demands immediate treatment.

Stop "sucking" by any means available; even your own hand is a possibility in the absence of an air tight dressing.

Place the victim in the recovery position with the injured side down, and transport to hospital as quickly as possible.

Shock

The victim of any kind of accident or medical emergency will often suffer shock in addition to his injuries. Shock is one of the most dangerous things you will encounter in an accident situation, and can lead to death if not properly treated. Shock may occur immediately, or it may happen several hours after an accident.

A person in shock is pale, perspiring, and feels faint or disoriented. The pulse will be rapid and weak and the victim's skin will feel cold and damp.

Shock is often more serious than the injury itself.

No matter what the accident, after immediate first-aid treatment has been given, keep the victim lying down even if he doesn't want to. Handle a shock victim gently.

Keep the person warm, but not hot. A person in shock loses body heat rapidly, which makes the shock more severe. Cover him with a blanket or coat. If he is on the ground and his injuries permit movement, put a blanket underneath him.

If the victim is conscious, they may be given small amounts of liquid. If the wound is in the stomach or lower chest, or if internal bleeding is suspected, do not give the victim anything to eat or drink, even though he may be very thirsty.

Unconsciousness

An unconscious victim presents special problems. All unconscious victims are in danger of suffocating.

Check for unconsciousness by calling the victim and tapping their shoulder.

If you get no response, check for breathing. Look for chest movement. Listen for breathing. Feel for breath on your cheek.

If the victim's breathing is noisy (gurgling or snoring sounds), he starts to vomit or bleed from the mouth, or if you must leave him briefly, place the victim in the recovery position.

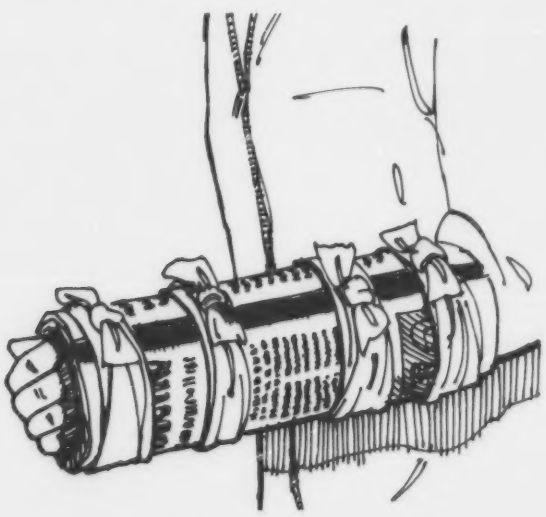
Once the three most dangerous situations—breathing, bleeding, and shock—have been

treated, you may begin treating other injuries. This manual cannot describe all possible injuries, but several common ones are discussed below.

Broken Bones

There are two types of fractures. A simple fracture is a closed break where there is no wound associated with the broken bone. A compound or open fracture is one where there is a wound and therefore a danger of infection to the bone. It may be difficult to detect a fracture. If in doubt treat as if a fracture exists.

Symptoms of a fracture include swelling, pain, inability to move the injured part, deformity, and tenderness at the site of the injury.

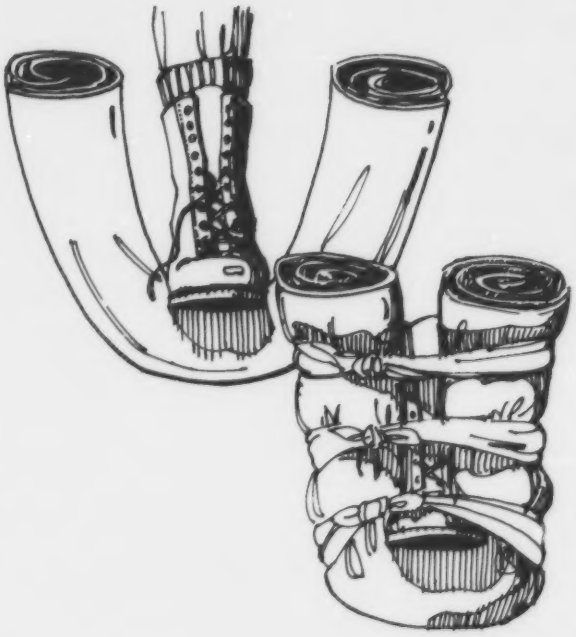


Handle the victim gently. Cover wounds with sterile dressings to prevent infection. Immobilize the fracture with splints or by tying the injured limb to the victim's body.

Don't move broken limbs to their "natural" position. Splint them where they are.

Sprains

Sprains are an injury to ligaments and muscles around a joint. Symptoms are swelling, tenderness, and pain.



Keep the injured limb raised on a pillow or rolled blanket. Treat a severe sprain like a fracture and immobilize with splints. Applying cold compresses will reduce swelling.

Blisters

Although they may seem minor, blisters on your feet can become major injuries if not treated properly.

Inspect your feet often for tender red patches which are the beginnings of blisters. Cover these areas with moleskin or adhesive tape to protect the skin from being rubbed by your boot.

Once a blister has formed, make a donut bandage (a round pad with the centre cut out) to protect the blister. Do not break blisters, as this opens the way to infection.

Exposure

Exposure is caused by extremes of heat or cold. Excessive heat exposure may cause heat exhaustion or sun stroke.

Heat exhaustion is caused by exposure to high temperatures. The body loses much fluid through sweating and strain is placed on the circulatory system.

Remove the victim to a cool area. If conscious, give fluids to drink. If unconscious, place the victim in the recovery position, loosen their clothing, and watch for breathing problems.

Sun or heat stroke is caused by high body temperature and a limited ability to sweat. Blood circulation to the brain is reduced, which can be very serious.

Remove the patient to a cool area. Decrease body temperature as rapidly as possible by sponging with cold water and ice. Elevate the head and get immediate medical aid.

Hypothermia

Hypothermia is a dangerous condition caused by the body losing heat faster than it can produce it. Exposure to wind, wet, and exhaustion causes hypothermia which is the number one killer in the outdoors. The major factor is almost always inadequate clothing. Often called exposure, hypothermia is particularly serious as it affects the mind as well as the body.

The symptoms are difficult to recognize at first in someone else, and even harder to recognize in yourself. Signs are uncontrolled shivering, fumbling hands, frequent stumbling, fuzzy thinking, slow speech, and drowsiness. If not recognized and stopped, memory lapses and numbness follows which can end in stupor, collapse, and death.

The best way to fight hypothermia is to avoid it. Up to 50 percent of body heat can be lost through the head. If your feet are cold, wearing a hat will help keep them warm. Don't sit or lie down on the cold ground and always carry an instant body shelter, such as a sheet of plastic, or survival blanket for protection from wind and wet. If the air is very cold, preheat it through a scarf as you breathe and don't sweat; slow down.

Treatment

Treatment includes moving the victim to shelter and warmth as quickly as possible. It there is no shelter, build a fire.

Remove the victim's wet clothes and get them into a warm sleeping bag if possible. Skin-to-skin contact is the most effective way of warming the victim. Get into the sleeping bag or lie as close as possible to the victim. If they are semi-conscious or worse, try to keep them awake. As the victim recovers, give them plenty of warm, non-alcoholic, sweet liquids.

Don't attempt to warm up by exercise. This only uses up vital energy.

(3) Movement of Victim

After first aid treatment has been given, other actions may be considered. The most important part of transporting an accident victim is making sure that movement does not further complicate injuries.

Before you move a victim, consider the nature of the injury, the distance from help, the type of terrain, weather, and time of day.

The safest method for moving all types of injuries is the stretcher, which can be improvised from many materials (e.g., coats, poles, or blankets).

If you must leave a victim to go for help, make sure the victim is out of shock. Consider his state of mind (can they stay alone?) and protection from weather conditions.

You should also make sure you know your destination and route thoroughly. Be able to reach help even if the weather changes for the worse. Be certain you can direct help to the exact location of the victim.

Consider these points carefully before you take action and always keep in mind that it is your responsibility to try to save a life without endangering yourself or others.

FIRST AID REVIEW

1. List the three objectives of first aid.
2. What are the three priority conditions that must be treated immediately?
3. Describe two ways you can protect a victim from further harm.
4. List the steps to start a victim's breathing.
5. How do you stop external bleeding?
6. Describe the symptoms of shock.
7. What is the treatment for shock?
8. Identify the symptoms of a broken bone.
9. Outline the treatment for heat stroke.
10. What is the treatment for hypothermia?
11. Describe the conditions that would allow you to move a victim.

SUMMARY

In summary, the step-by-step procedure to survival is:

1. Stay put
2. Maintain composure and begin first aid
3. Build a fire
4. Build a shelter
5. Construct signals
6. Locate water and food

FIRST AID SUPPLEMENTAL CONTENT

Heart Attack and Strokes

Heart attacks have a variety of causes and first aid is very important. Symptoms include pain in the chest (may not always be present), a shortness of breath, dizziness, and sometimes unconsciousness. First aid includes:

1. Send for medical assistance immediately.

2. If the victim is conscious, calm and reassure him. Intense emotion often brings on an attack.

3. Don't move the victim unless absolutely necessary. If he has difficulty breathing, keep him in a sitting or sem-reclined position, or raise his head and chest on supporting material like pillows.

4. Don't allow the victim to exert himself in any way.

Strokes occur when blood circulation to a vital part of the brain is blocked. A "small" stroke produces very mild symptoms and may be wrongly ignored. A series of small strokes may precede a major stroke and lead to death or paralyses.

Symptoms of a small stroke include headache, dizziness, weakness, loss of muscular use in some part of the body, and brief loss or impairment of speech, memory, or vision. Convulsions, paralysis of one side of the body or face, and bulging eyes are indications of a major stroke.

In either case:

1. Call for medical help immediately.

2. Have the victim lie down on his back, if possible. If he is having trouble breathing or is vomiting, place him in the recovery position.

3. Loosen his clothing and keep him warm but not hot.

4. If he is to be transported be sure he is lying down, preferably with a pillow under his head.

Hearing and Sight Protection

Ear plugs are useful when shooting on a range or next to another shooter. Carry a pair of ear plugs and use them when you know there will be shooting or loud machinery. Don't wear them while hunting though; you will need to hear other hunters or game.

If you wear glasses, carry an extra pair and include another in your survival kit. Plastic lenses are better than glass which can break if you fall.

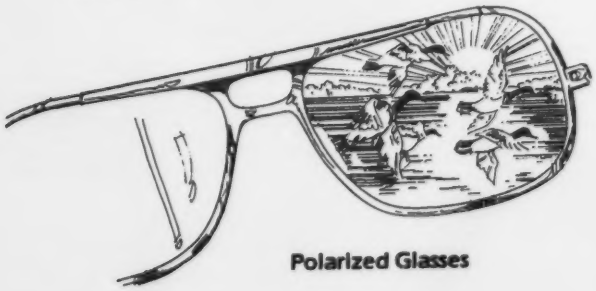
Everyone should take at least one pair of optically correct and ruggedly constructed sunglasses.

Tinted glasses can help the hunter to see his target clearly under varying light

conditions. For persons who are sensitive to the sun's glare, polarized sun glasses tinted green, brown, or smoky in color are recommended. Some lenses are specifically designed to help the wearer see better under dim light conditions.

If hunting in a snowy area wear snow goggles. You can make a pair by cutting small slits in a piece of wood or birch bark and tying these on with string.

Tinted Glasses



Polarized Glasses

Colour Vision

Colour vision is the ability to distinguish between colours and detect a range of colours within the visible light spectrum.

Many hunters are unaware that their colour vision is defective. When a hunter is aware that he has a colour vision problem, he can take extra precautions to overcome this problem. An eye examination will quickly detect any abnormality in colour vision.

Blaze orange is one of the most visible colours to wear in the woods. Tests have proved that fluorescent colours, especially blaze orange, are seen readily under almost all light conditions. Even persons with colour vision defects are usually able to distinguish blaze orange.

Snake Bites

The only venomous snake in British Columbia is a species of rattlesnake found only in the Southern Interior Dry Belt region. It is usually found in shady places in dry regions but may be near water at night. Avoiding a bite is the best remedy. Watch where you put your hands and feet. If you see a snake, ease back; sudden movements can trigger an attack.

Death from a snake bite is rare. Use first aid, then seek medical assistance.

For non-poisonous snake bites: wash thoroughly and watch for signs of infection.

For poisonous snake bites:

1. Establish if there has been penetration of the skin. Look for two fang marks. There may be excess venom on the skin.

2. Wipe off excess venom. Apply suction to the wound using your mouth. Venom is not poisonous if you swallow it. Work quickly, suction is only effective for about 10 minutes.

4. Watch for signs of poison—pain, headache, tightness of the mouth, and swelling of the wound.

5. If you conclude that the snake was poisonous get medical assistance. If possible have the victim carried.

Insect Bites

You may be bitten by mosquitoes, black flies, deer flies, and midges. Prevention is the best cure—protect yourself with head

nets, gloves, light coloured clothing and insect repellents.

If bitten:

1. Soak skin in warm water.
2. Apply a paste of clay and water to reduce swelling and itching.

Bee Stings

Unless you are allergic to bee stings or receive a number of stings within a few minutes, if stung:

1. Remove stinger with sterilized needle or knife blade tip.

2. Disinfect the area.

3. Apply cold compresses (mud or crushed leaves) to reduce swelling.

4. Apply bee sting medications from your first aid kit.

CHAPTER 2

FIREARMS SAFETY

2

FIREARMS SAFETY

Goal

To enhance student knowledge and skills relating to the safe and responsible use of firearms and ammunition used for hunting.

Objectives

The student will:

1. Select a specified firearm type or action;

2. Demonstrate the prescribed safe handling procedure to be followed when taking possession of a firearm;

3. Demonstrate safe firearm handling positions appropriate for the surroundings;

4. Determine information printed on firearms and ammunition and choose those that can be safely used together;

5. Choose the best illustrations; demonstrate or describe:

- sight adjustment and sight pictures
- target checklist items and aspects of positive target identification
- safe zones of fire
- loading/unloading procedures
- firearm carrying positions
- firearm and ammunition parts (particularly use of safety catches)
- fundamental aspects of rifle shooting
- safe firearm and ammunition storage

INTRODUCTION

In early times people used whatever materials were available as weapons for hunting animals. Stones, rocks, and branches were most likely used as clubs. In time, people learned to make wooden spears with fire-hardened tips. Slings and bolas, stones tied with thongs, were also used to propel projectiles at game. Later, chipped stone points were tied to spears, and spear throwers were developed to increase the spear's range and velocity. Bows, arrows, and poison-tipped arrow heads further increased the hunter's accuracy and killing power.

All of these hunting weapons had limitations. The hunter had to get close to the game, the projectiles had limited velocity, and the weapons had limited accuracy. However, the invention of gunpowder and firearms changed all that.

Firearms enabled hunters to increase their range and accuracy, and greatly increase their killing power. This power makes a firearm an extremely effective hunting tool, and a dangerous item if misused.

Firearm safety is critical for all persons using firearms, especially for hunters, who may share areas with other people. The distance over which modern firearms are lethal makes firearm safety a primary consideration for everyone.

How firearms work

Firearms are simple machines. They consist of a tube or barrel open at one end, with a chamber at the other. A round of ammunition fits into the chamber. When the primer is struck by the firing pin, it explodes, causing the powder in the case to burn. The gases formed by the burning gun powder push the bullet (projectile) along the barrel and out the end at high speed.

FIREARM CHARACTERISTICS

Parts of a firearm

This chapter focuses on rifles and shotguns only, since these are the only guns that can lawfully be used for hunting. Handguns are illegal for hunting and will not be discussed here, although there are many books that describe their use for sport shooting. The basic parts of a firearm include:

Action: the mechanism for inserting, ejecting and firing cartridges (there are several types)

Barrel: the tube that directs the bullet

Bore: the inside surface of the barrel

Breech: the closed end of the barrel

Butt: the end of the stock held to the shoulder. The fore end of the stock makes a grip for the barrel

Chamber: the part of the breech that contains the cartridge

Magazine: holds the ammunition

Muzzle: the open end of the barrel

Receiver: the metal frame which contains the breech, locking mechanism, and reloading mechanism

Safety: a mechanical device intended to prevent the firearm' from accidental discharge

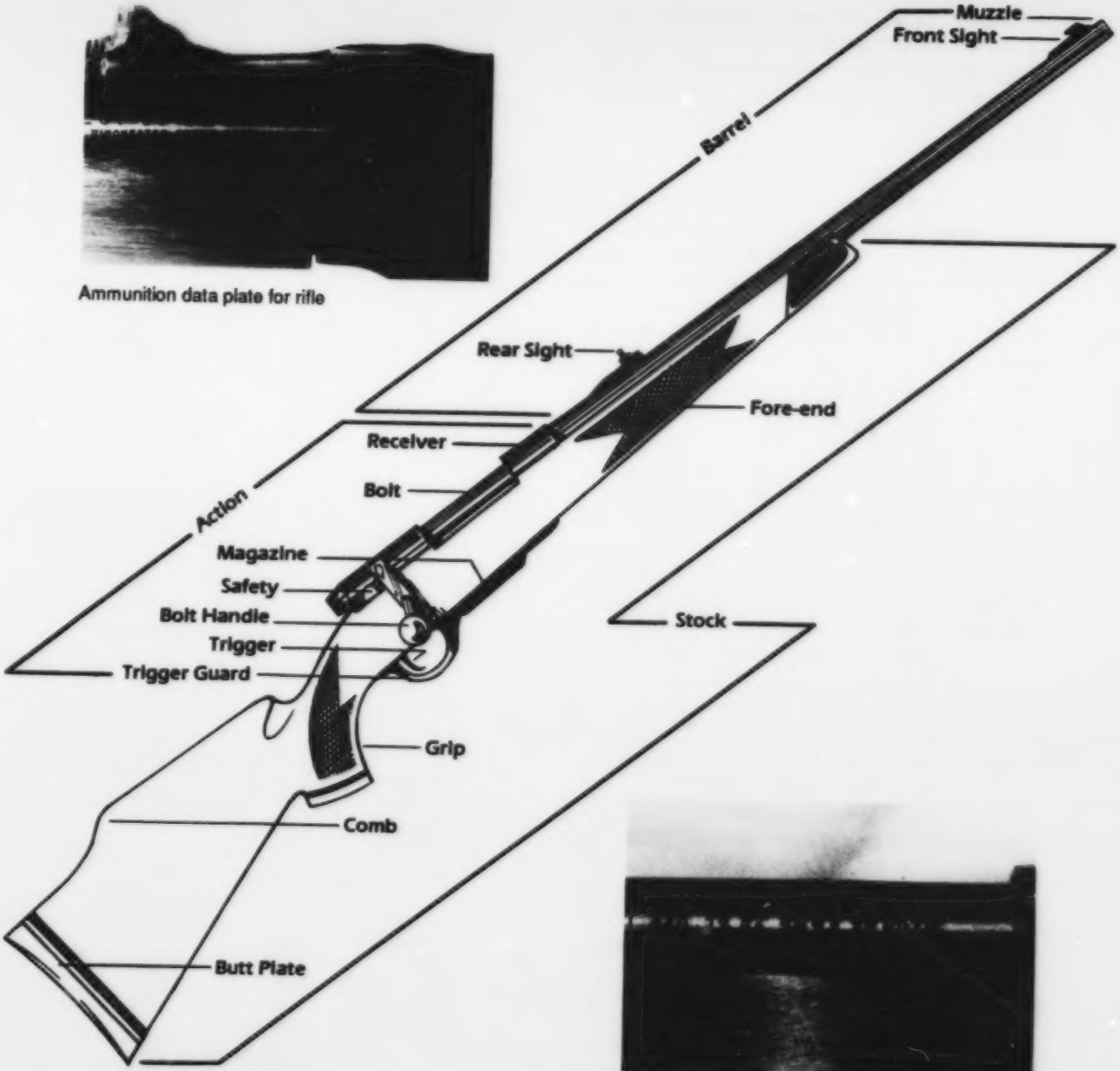
Sights: fixtures for aiming the firearm (there are several types)

Stock: the grip for the firearm, usually made of wood (also plastic or metal)

Trigger: the mechanism that is used to fire the firearm

Trigger guard: protects the trigger

Ammunition data plate for rifle



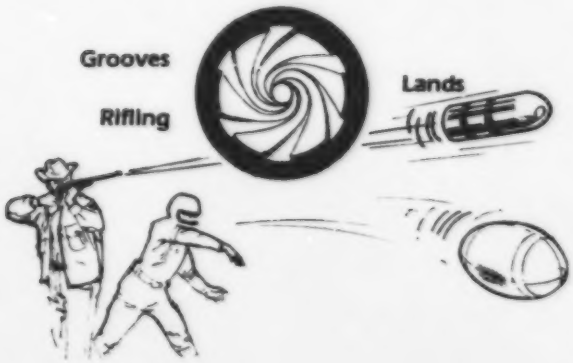
Ammunition data plate for shotgun

DIFFERENCES BETWEEN RIFLES AND SHOTGUNS

There are four basic differences between rifles and shotguns. These differences determine the specific uses of each of these firearms.

1. *Grooved vs Smooth Bore*

A rifle gets its name from the presence of spiral grooves in the bore called "rifling". These grooves spin the bullet, thereby increasing the rifle's range and accuracy. A shotgun's barrel wall is thinner than that of a rifle, and its bore or inside surface is smooth.

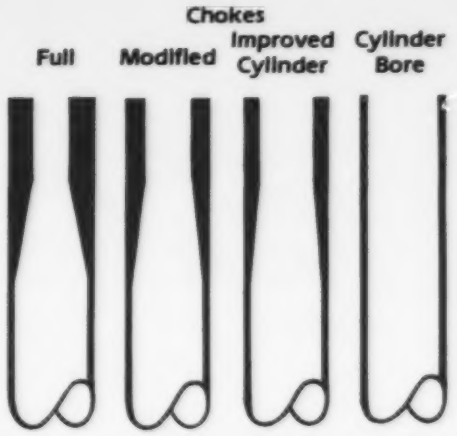


2. *Single vs Multiple Projectiles:*

A rifle cartridge consists of a single bullet or projectile in a case. A shotgun shell consists of a number of shot pellets inside a paper or plastic cylinder with a brass base.

3. *Long Range vs Wide Spread*:

A rifle bullet may travel more than 3,000 feet per second and have a range of several miles. A shotgun, however, spreads or sprays its charge of shot in a widening radius. The exact spread of the shot is determined by a constriction or narrowing at the muzzle called "a choke". The shot pellets travel at about 1,100 feet per second and have a maximum range of only a few hundred yards.



(See also diagram on page 70.)

4. *Presence of Sights*

The sights on a rifle are constructed for accurate aiming, while those on a shotgun are less accurate and used more for simply pointing.

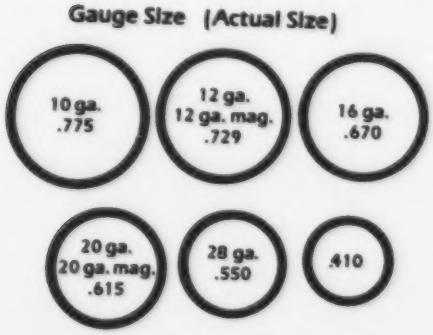
The following section discusses the different parts of a firearm in more detail.

Calibre and Gauge

The calibre and gauge are measures of the bore or inside diameter of the barrel used by a particular rifle or shotgun.

The *calibre* is a direct measure of the inside diameter of a rifle barrel. It is expressed in hundredths of an inch, e.g. a .22 calibre rifle has a bore of 22/100 inch in diameter.

The *gauge* refers indirectly to the bore diameter of a shotgun. It is not a direct measure but is calculated as the number of lead balls of the bore diameter required to make up one pound. Thus, a 16 gauge shotgun has a bore diameter such that 16 lead balls of the bore diameter would weigh a pound. This means of gauge measurement has no connection to the variety of shot sizes that may be found in shotgun ammunition. The one exception to the indirect measurement of gauge is the .410 shotgun. In this case, the measurement refers directly to the actual bore diameter in hundredths of inches.



Actions

Actions are the firearm mechanisms that fire the ammunition then eject used ammunition cases and insert or allow you to manually insert a new cartridge into the chamber. Except for single shot firearms the action mechanism picks up a cartridge from the magazine with each complete cycle. There are five basic types of actions on firearms. They may be found on either rifles or shotguns.

1. Bolt action

A bolt action firearm operates on a lift, pull, and push sequence similar to a door bolt. This is a common type of action on hunting rifles. A new cartridge will be fed in manually from the magazine.

2. Pump action

A pump action operates by pushing the action release button and pumping the fore-end of the stock back and forth in order to open and close the action.

3. Lever action

A lever action firearm has a metal handle which is located just behind the trigger. To open the action, you pull the handle downward away from the stock.

4. Hinge action

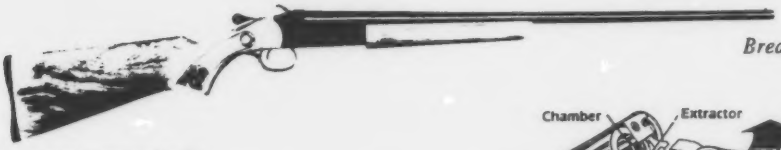
A hinge action firearm opens or "breaks" in the centre, similar to the movement of a door hinge. To open the action, the release handle is pushed to one side and the barrel or barrels are pressed downward. The used shell is then ejected, new shells are inserted manually and the barrel is closed. This is a common type of action in shotguns.

5. Semi-automatic action

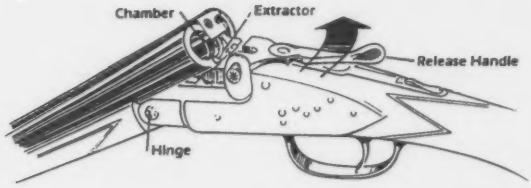
The action of a semi-automatic firearm is opened by pulling back a handle. Once the first round is shot, the action ejects the used case and inserts a new round from the magazine into the chamber. Most models of semi-automatics will stay open when empty.

You must be able to recognize which type of action a rifle or shotgun has and be able to operate it safely and correctly. Before handling any firearm, you must know how to open the action by using the action release so you can check that it is empty.

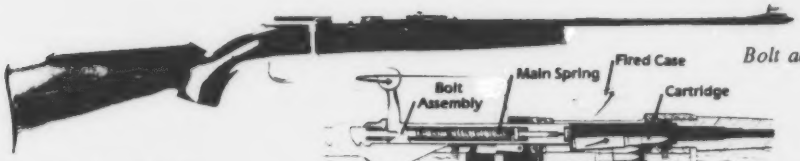
Break or breech action shotgun



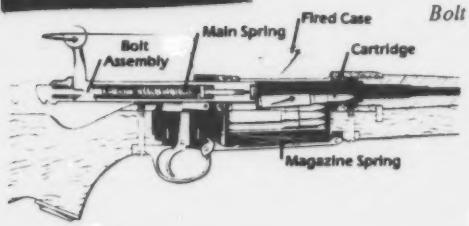
The hinge action firearm opens, or "breaks" in the centre, similar to the movement of a door hinge. To open the action, the release handle is pushed to one side and the barrel or barrels are pressed downward.



Bolt action repeating rifle.

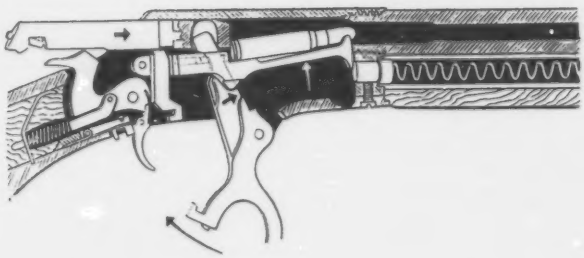


A bolt action firearm operates on a lift, pull and push sequence similar to a door bolt and even looks very similar.



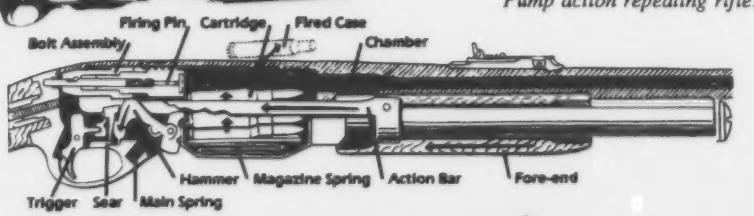
Lever action repeating rifle.

A lever action firearm has a metal handle which is located just behind the trigger. To open the action, the handle is pulled downward away from the stock.



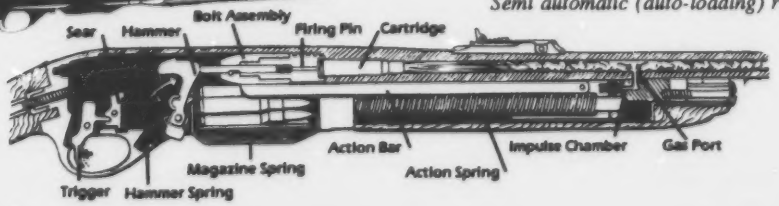
Pump action repeating rifle.

On a pump action firearm, the fore-end of the stock is pumped back and forth in order to open and close the action. The pump action firearm is sometimes called a "slide" or "trombone" action.



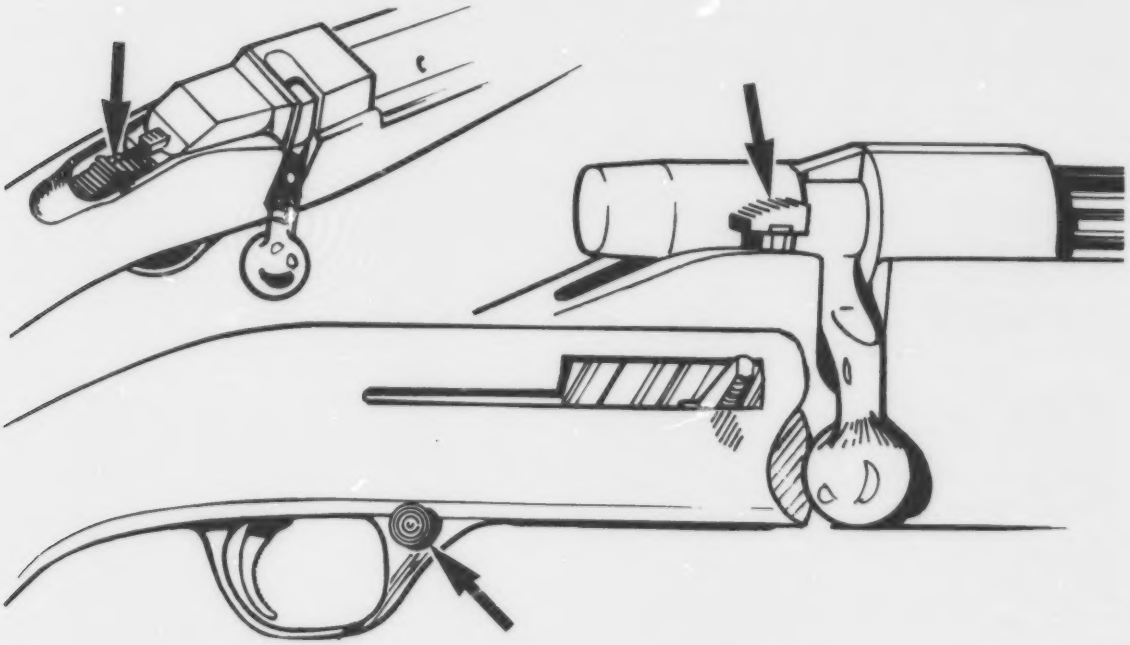
Semi automatic (auto-loading) rifle.

The action of a semi-automatic firearm is opened by pulling back a handle. Most models of semi-automatics will stay open when empty. Others must be held open.



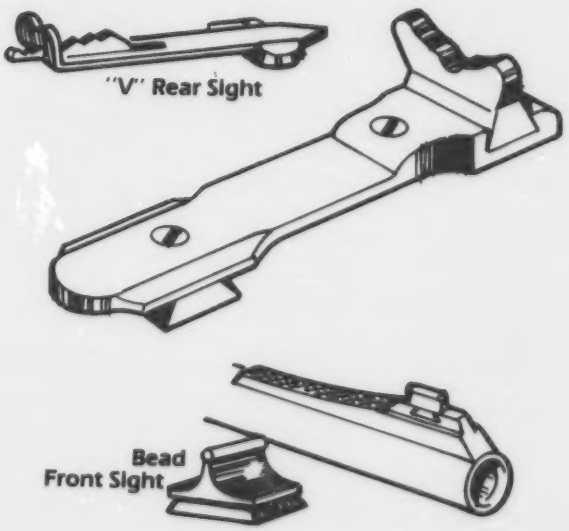
The Safety

The safety on a firearm usually locks the trigger, thereby blocking the firearm's action so it cannot be fired. In order to fire a firearm, the safety must be in the "off" position. Located near the trigger, it can be released easily and quickly before shooting.



Sights

A sight is a device used to aim the firearm. There are three basic types of sights: open, aperture and scope. Rifles may have any of these three types of sights. Most shotguns have only a front sight called a bead, although some may also have open sights.

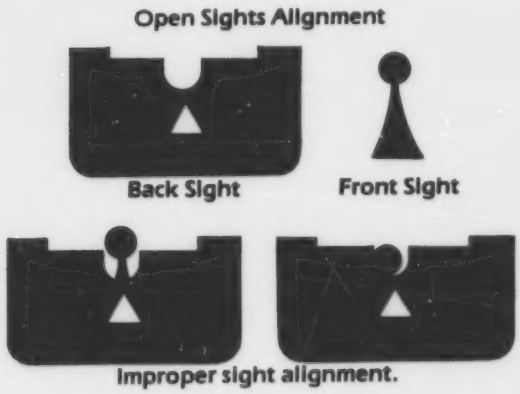


Open sights

Most factory-issued rifles are equipped with an open rear sight and front bead sight. To aim, you must line up the front bead with the rear open sight and with the target. This type of sight requires time to aim accurately and may be used successfully when speed is not a factor.

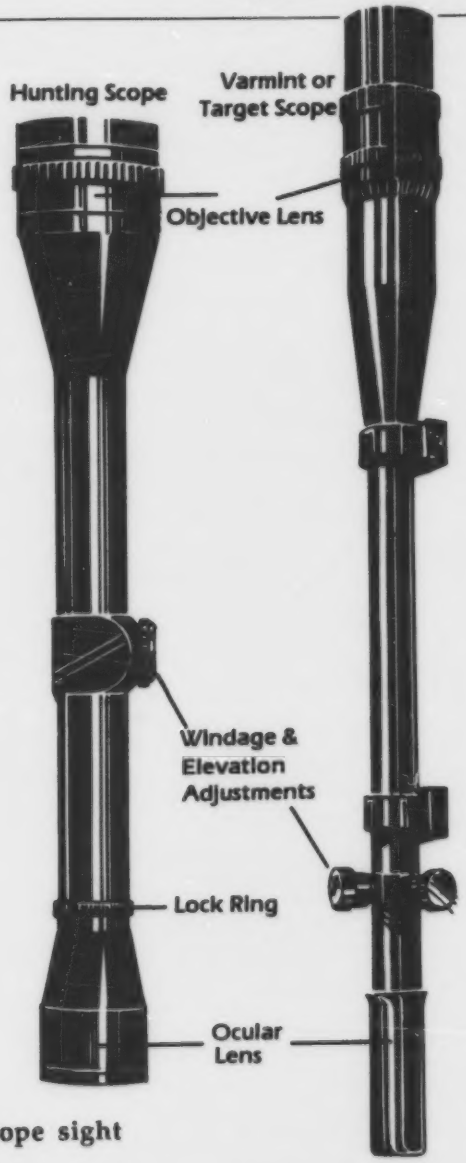
Sight Alignment and Sight Picture

Of the three types of sights, only the open sight requires you to physically line-up the sights. This process is called "sight alightment." The advantage of aperture and scope sights is they do not require conscious alighment. The aiming of any sight at a target creates a "sight picture".



Improper sight alignment.

Proper alignment and sight picture.

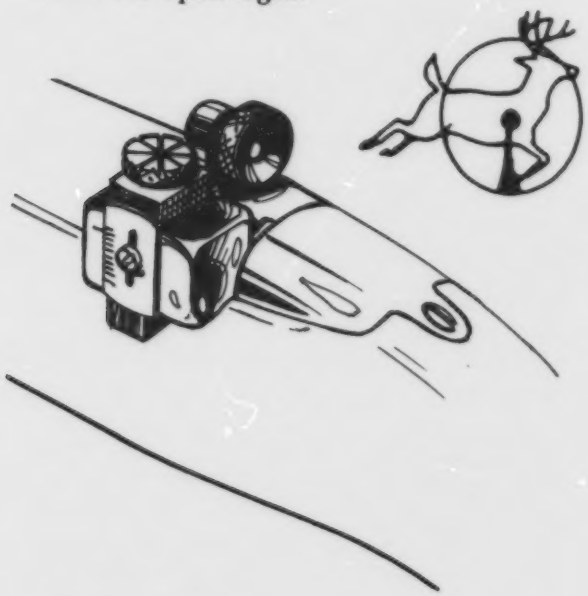


Scope sight

The scope sight is a mini-telescope mounted on the rifle. It simplifies sighting because you need to focus on only one object—a known target. The scope sight helps you see the target better because it magnifies it, making the target appear larger and closer. It is also designed to gather light, so you can sight a target even under dim light conditions. To use the telescopic sight, shoulder the rifle bringing the telescopic sight up toward your eye while looking at the target.

Aperture sight

The aperture sight is called a "peep" sight because it has a small hole that you peep through to aim at the target. All you have to do is look through the peep hole at the front sight, then hold the front sight on the target. The aperture sight is more accurate than the open sight.

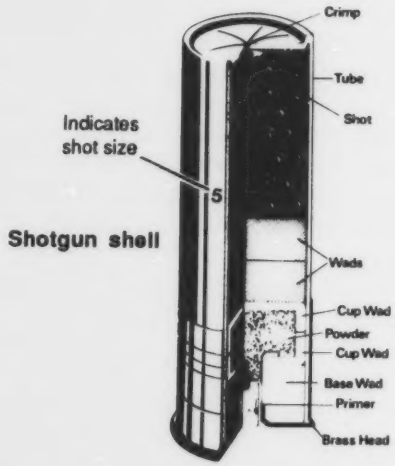


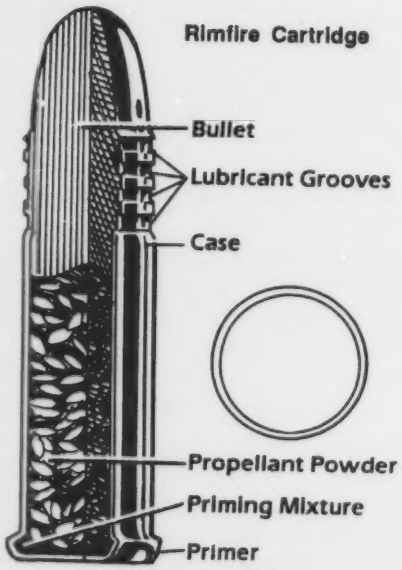
Ammunition

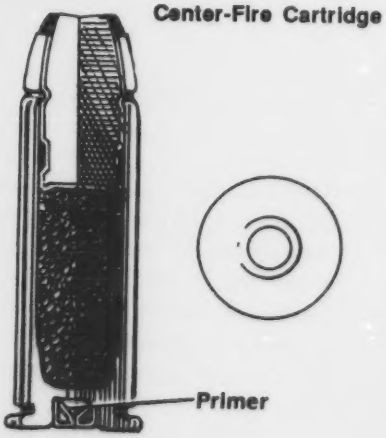
The ammunition used in rifles and shotguns varies in size, appearance, and makeup. Rifle ammunition is made up of four basic components, while shotgun ammunition has five components.

A *bullet* is a projectile that is shot from a rifle. It is make of lead and may have a jacket of harder metal such as copper. *Shot* is the projectile fired from a shotgun. The shot may be a single piece of lead or a number of lead or steel pellets combined in one shotgun shell.

Game or hunting bullets usually have a soft or hollow point. These bullets are designed to expand or flatten upon impact, thus expending all their energy upon entry.







Target bullets often have solid points which make a small hole because they do not expand. Bullets and shot come in a variety of different sizes and weights.

The *case* is a container in which all other ammunition parts are assembled. The case is commonly made of brass, steel, copper, paper, or plastic.

The *powder charge* is a chemical compound which, when burned, forms gases which propel the bullet or shot through the barrel.

The *primer* is a chemical mixture which explodes when hit. The flame of the primer explosion ignites the powder charge.

In the shotgun shell, there is a fifth part called a *wad*. Wads are used to separate the powder from the shot, and to hold the loose shot together as it travels through the barrel.

Rimfire and Centre-fire

There are two basic types of modern ammunition—*rimfire* and *centre-fire.*
In rimfire ammunition, the priming chemical is located around the inside bottom rim of the cartridge case. The rim must be soft enough to allow the firing pin of the firearm to dent the rim when it strikes it. This process crushes the priming compound, which then explodes, igniting the powder. Rimfire ammunition is used in low-pressure firearms.
In centre-fire ammunition, the primer is located in the centre of the cartridge case bottom. The firing pin strikes the primer, exploding the priming compound and igniting the powder charge.

The potential killing power of a bullet is determined by its energy upon impact. The factors that determine impact are the bullet weight and the charge of powder which combine to create the velocity of the bullet. A bullet's potential killing power can be determined by using charts.

Choosing a Firearm and Ammunition

Your choice of a firearm and ammunition depends on 3 factors:

1. the hunting laws and regulations;
2. the type of game species that you are hunting, and;
3. the habitat in which you are hunting.

Check the current hunting regulations synopsis for the ammunition and firearms that cannot be used for hunting game animals, game birds, or migratory birds.

The ammunition you choose depends on the game you are after and the habitat. This can be chosen from a chart. Full metal jacket hard point ammunition, tracers, and explosives are prohibited and illegal for all hunting.

You must make sure that the ammunition matches the firearm you are using. The calibre or gauge will usually be imprinted in the metal of both the firearm (on the breech end of the barrel) and the flat end of the casing of most ammunition. Shotgun ammunition usually has information concerning the shot size contained within and the length of the shell printed on the side of the casing. Rimfire ammunition, because of its small size, may not be imprinted. Check the label on the box of ammunition carefully for calibre or gauge and shotshell length, bullet weight, type of bullet, and velocity. Be positive that the ammunition you use exactly matches the ammunition specifications printed on the firearm. There is a considerable difference between .303 *British* and .303 *Savage* ammunition for example.

Be sure your shotgun is designed for modern cartridges and powder. A 12 gauge shotgun may be chambered for 2 3/4 inch or 3 inch (sometimes called magnum) length ammunition or both. For shotguns you must

be sure of the correct gauge but also the length of the cartridge it is designed to use. This information should be printed along with the gauge on the outside of the barrel at the chamber end. Look at the illustrations on page 41.

FIREARMS REVIEW

1. Name the parts of the rifle in the diagram.

2. What are four differences between a rifle and a shotgun?

3. Define: calibre, gauge

4. Name five types of actions.

5. What is the purpose of the safety?

6. List three types of sights.

7. List the four parts of a rifle cartridge.

8. What criteria should you use to choose a firearm and ammunition?

FUNDAMENTALS OF RIFLE SHOOTING

Marksmanship

Marksmanship is the ability to hit your mark or target. It is important that a hunter be a good marksman for two major reasons.

The first reason is safety. If you have the ability to hit your target, you will be self-confident. When you know you can shoot accurately, you will not need to spend time thinking about how to shoot, but can concentrate instead on where to aim. You will have time to think--Is this shot safe? Is the path to and beyond the target clear?

The second reason is to make a clean kill. An accurate shot will kill quickly, cleanly and humanely. A good hunter practices marksmanship skills until his shots are consisltently accurate and studies animal anatomy to know where vital organs are located.

Shooting excellence depends on several fundamental telchniques which must be learned and practiced. They are aiming, trigger squeeze, breath control, follow through and shooting position.

AIMING

Dominant Eye

The "dominant eye" is the eye you use for sighting purposes. The dominant eye is the stronger of your two eyes. The eye will judge speed and range, and focus more accurately than your other eye.

Even though you are right-handed, you may have a left dominant eye. If you are not sure which is your dominant eye, your instructor will be able to help you determine which of your eyes is the dominant eye.

Trigger Control

Correct trigger control is essential for an accurate shot. When the sights are aligned on your target, squeeze the trigger slowly and steadily. Do not jerk the trigger. Anything other than a smooth squeeze will cause the sitght picture to waiver and will send the shot off target.

Do not tense before the rifle fires. You should be relaxed, allowing each shot to happen as a surprise.

Breath Control

Controlled breathing is necessary to shoot accurately. As you breathe in and out, it is normal for your chest to rise and fall and your arm to waver. So will your gun barrel unless you control your breathing at the exact moment you fire.

When you are in a shooting position, with your cheek hard against the stock, take a deep breath, exhale a portion of it, and hold your breath while you aim and squeeze the trigger. This should allow you to hold the barrel and sights in perfect alignment on the target at the final instant when the gun fires.

If you hold your breath too long, you may lose control and your shot will be off the mark. If you run out of breath before firing, relax, take a deep-breath and do it again.

Follow Through

Follow through, which simply means continuing to hold still until after the bullet has been fired, is important to accurate shooting. If the rifle is moved a split second too soon, your arim will be off target. Follow through will ensure the rifle isn't moved until the bullet is well on its way to the target.

GENERAL RULES OF FIREARMS SAFETY

Proper firearm handling is the most important element of hunter safety. Careless handling of firearms can cause death or injury to hunters or their companions before they see their target or even reach the bush.

Ten basic rules must be followed whenever a firearm is handled or used. The first four rules apply whether you are in a home or building (such as a gun store), in a vehicle, at a shooting range, or while hunting. The ten basic rules are:

1. Always point the muzzle of a firearm in the safest direction.

2. Open the action of a firearm as soon as you pick it up for any reason.

3. Look into the chamber and magazine to ensure the firearm is unloaded after opening the action.

4. Do not put your finger in the trigger guard until ready to fire.

5. Be certain the barrel is free from obstruction. This should be done before loading and periodically during movement in the field.

6. Check for the correct ammunition for the firearm you are using.

7. Use the safety but don't rely on it.

8. Never climb a tree or fence or jump a ditch with a loaded gun.

9. Be sure of your target and beyond before you pull the trigger.

10. Treat every firearm as though it were loaded.

FIREARMS SAFETY AT HOME

When you have firearms in your home you must make sure they are safe from misuse by anyone. You must be especially careful if there are children in your home. Some important rules to follow for safety at home are:

Every time you handle a firearm for any reason, and before storing a firearm, first check to see that both chamber and magazine are empty. The only guaranteed safe firearm is one which has the action open.

Firearms may be stored in a variety of ways, away from dirt and moisture and locked in a secure location. A firearm should never be left in a position where it can be knocked over, nor left where it can be handled by the inexperienced. Lock up your firearms.

Firearms and ammunition should always be stored separately. This will make it difficult for an unauthorized or inexperienced person to obtain both a firearm and ammunition at the same time. If you have bolt action rifles, store the bolts in a third place.

Firearms should be carefully cleaned and maintained at regular intervals. This will ensure proper operation and enable you to become familiar with the firearm and its safe operation.

Let all members of your household know there are firearms and ammunition in the house. Do not make them a mystery and therefore an attraction for children by hiding them. Explain the potential danger of improper use and handling of firearms to all household members, and especially to children.

Safe Loading and Unloading Procedure

At all times ensure your firearm is pointed in the safest direction. Load and unload your firearm away from others.

Safe Loading Procedure:

1. Release safety
2. Open action
3. Ensure barrel is clear
4. Load correct ammunition in chamber or magazine
5. Close action
6. Engage safety

Safe Unloading Procedure:

1. Release safety
2. Open action
3. Clear chamber and magazine

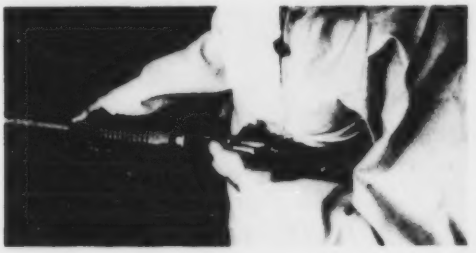
BEFORE LEAVING HOME

There are a number of things you can do before you leave home that will improve your safety and enjoyment of hunting.

Join a gun club. This will allow you to meet and talk to experienced firearms users. You may be able to take specialized instruction at the club and you may also get experience handling a variety of firearms with other members.

You will also have a safe place in which to practice with and adjust your firearm. If you do not belong to a gun club, find a safe place to practice shooting. Check municipal shooting by-laws. Use a place that has a safe backstop such as a hillside or sand pit. Make sure that there are no large rocks or other hard surfaces that will deflect the bullet in unknown directions. Be certain that there are no buildings or animals in the area, and that nobody can blindly walk between you and your target. Be sure that you have permission to use the property.

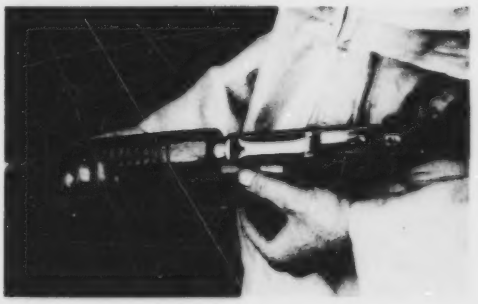
Aspects of Safe Loading Procedure:



Ensure that the firearm is unloaded.

Be aware of your surroundings. Always point the muzzl of your gun in a safe direction.

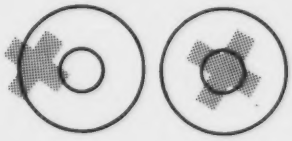
Be sure the barrel is free of obstructions.

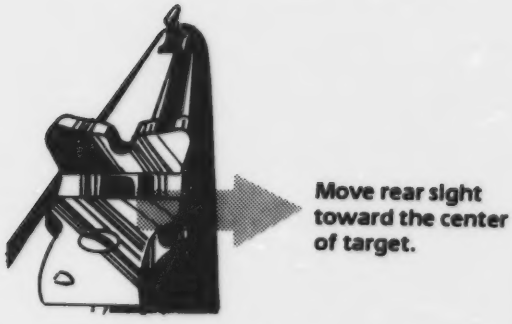


Load with correct ammunition.

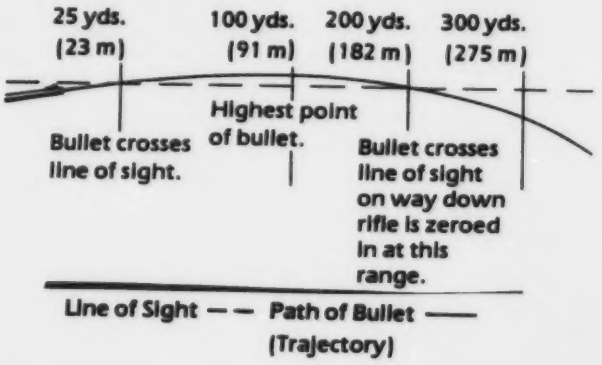
Before hunting, your rifle must be *sighted-in*. This means that the rifle's sights must be adjusted so that the bullet will hit a target at a specific range. This is the first step in preventing the waste of game meat.

Set up a target with a safe back-stop at 25 metres and fire at least three test shots. Be sure to use the same type of ammunition you will use when hunting. Check the target. If the group of hits is not at your point of aim, adjust the rear sight in the same direction you wish to move your hits. If the shots are not grouped together, it could be due to your technique or some other mechanical factor. Get someone to help you with your technique.





If your shots are on the point of aim at 25 metres, they will be on the point of aim again at approximately 200 metres due to the bullet's curved trajectory. Use the ballistics table provided to determine the trajectory for your particular firearm and bullet type at various ranges.


25 yds. (23 m)
100 yds. (91 m)
200 yds. (182 m)
300 yds. (275 m)
Highest point of bullet.
Bullet crosses line of sight.
Bullet crosses line of sight on way down rifle is zeroed in at this range.
Line of Sight — — Path of Bullet ——
(Trajectory)

After your rifle is sighted-in, *practice shooting* under various light and weather conditions, and at various distances.

Practice shooting so you know what your sight picture looks like, and how your sights look in relation to each other and the target.

Know the vital target areas of the game you will be hunting. You can learn this from other hunters or books. Know what your sight picture is in relation to the.animal you are targetting.

Practice using your firearm so you are very familiar with its safety, action, weight, loading, and unloading procedures. Learn about the ammunition you will be using, and its velocity and range.

Very occasionally, a loaded firearm will not immediately fire when the trigger is pulled. When a "hang fire" occurs, slowly count to 10 while pointing the muzzle in a safe direction, then remove the defective cartridge.

SAFETY WHEN TRAVELLING

You must take precautions for safety when travelling with a firearm.

In preparation, always be sure that the firearm is clean and that the barrel(s) is/ are free from obstructions. Many strange things can happen during winter storage to plug up a barrel.
Decide on the appropriate ammunition and take only that type of ammunition with you. This will eliminate possible confusion and loading the wrong ammunition.

It is illegal and of the utmost danger to carry a loaded firearm in a vehicle. Remember this not only at the start of your trip, but each time you re-enter a vehicle to change hunting locations or even move down the road. Unload your firearm before approaching your camp, car or truck, preferably thirty or forty feet away.

Carry your firearm in a protective case and position it securely so it will not move about during travel.

Keep firearms and ammunition out of sight in your vehicle. Exposed firearms may tempt someone to break into your vehicle to steal them.

If you are going on public transportation such as a bus, train or plane, check first with the carrier's agent concerning their regulations on firearms and ammunition.

SAFETY WHEN HUNTING

When hunting there are a number of variations on the basic safety rules that you should follow.

1. Load or unload your firearm with its muzzle pointing in the safest direction, well away from you and others.

2. Use but do not depend on the safety. A worn mechanism can allow a firearm to fire even when the safety is on. Keep your finger outside the trigger guard except when you are ready to fire.

3. Be aware of your companions' positions to avoid pointing your muzzle at them. Never shoot in their direction. Always point your muzzle in a safe direction and be able to control its direction whatever the circumstances, even if you fall or trip.

4. When entering a farm yard or meeting another person, unload your firearm and leave the action open so that others can see it is safe. Remember, the only obviously safe firearm is one with the action open.

5. Always identify your target positively. Don't shoot until you see the whole animal.

6. Never use a rifle scope to observe other hunters, or to identify an object.

7. When stopping to rest in the field always unload your firearm. Leave the action open and store it temporarily with the muzzle pointed in a safe direction.

8. Be sure your barrel remains free of obstructions. Snow or mud can easily enter the muzzle and escape the notice of a careless hunter. The result can cause the barrel to explode.

9. Never drink alcohol or use drugs when hunting or handling firearms.

CARRYING POSITIONS

There are a variety of ways to carry a firearm. These have been proven to be not only safe but convenient and the least tiring.

The *two-hand or ready carry* is the safest firearm carrying position for hunters, as it gives the best control of the muzzle. Grip the small of the stock in one hand and the fore end in the other holding the muzzle upwards.

The *cradle carry* is another safe carry. Grip the small of the stock in your trigger hand while cradling the barrel in the bent elbow of your other arm. However, note that the muzzle points to one side, which means that this carry should not be used when walking with anybody on this side.

The *trail carry* is good when you are walking abreast with your companions. This position should not be used when walking behind

someone. Hold your firearm by the stock in one hand at your side with the muzzle pointing downward and forward.

The *elbow or side carry* is safe in open terrain but should not be used in the bush as branches can get tangled around the firearm and push the barrel downward. Hook the firearm over your elbow of your trigger arm; it will point to the ground. Again, do not use this carry when walking behind someone.

The *shoulder carry* is safe when walking beside or behind (but not in front) of someone. Lean your firearm over your shoulder with the muzzle pointing in the air.

The *sling carry* is used when you must walk a long way or need to keep both hands free. Do not use it in dense bush because the firearm may get caught and be pulled off your shoulder. Hang the firearm from one shoulder by its sling. The muzzle should be pointed in the air behind you.

Choose your carrying position depending on the terrain and the location of your companions.

SAFETY IN OPEN COUNTRY

If you are hunting in open country there are some special rules to follow:

Never shoot near a building; some person may be using it as a shelter.

When crossing a fence or area of unsure footing, unload your firearm and leave the action open. If you wish to cross a fence alone, place it on the other side of the fence and cross further down the fence row. If you are in a group, one hunter should hold the unloaded firearms while the others cross the fence. Remember to check your muzzle for dirt if you lay your firearm on the ground. A piece of tape over the end of the barrel will prevent the entrance of dirt or snow as long is it is intact and will not interfere with shooting.

Don't shoot at game over the rise of a hill since people or livestock may may be in the line of fire over the hill.

Always be sure of your target and the space beyond your target.

SAFETY IN THE WOODS

In the bush, always remember that a person or livestock may be standing out of your view, yet close enough to be injured.

Be prepared to control your muzzle and trigger under all circumstances. A twig may pull your trigger or a branch may swing your muzzle around. Falls are common on slippery rock, fallen timber or icy ground and are dangerous to yourself and your companions unless you are prepared.

THE RANGE OF VARIOUS FIREARMS

A. 30-06 Rifle 2½ miles.
B. .22 Rifle one mile.
C. Shotgun with shot 300 yards.

FIREARM SAFETY REVIEW

1. What are the first four general rules of firearm safety?

2. Name three safety procedures for storing firearms in the home.

3. What are two safety procedures you should take before leaving home on a hunt?

4. List three safety procedures to use when travelling with a firearm.

5. What are five safety procedures to follow when hunting?

6. Explain the trail carry and when it should not be used.

7. List two rules for hunting in open country.

SAFE TARGET IDENTIFICATION

Proper firearm handling is always important to hunter safety. However, when you raise your firearm to shoot something you are faced with a critical situation in which an unintended victim such as another hunter or person or animal may be shot or killed. You must always ask yourself:

"Am I sure of my target?
"Is it a legal game animal?"
"Is there anything else in the line of fire?"

Answer all these questions before you squeeze the trigger.

An incorrect decision may result due to inexperience or ignorance of the characteristics and habits of game animals, the tension and eagerness of an inexperienced hunter, or impairment from drugs, alcohol or lack of sleep. If you make an incorrect decision you are responsible for any unintended results.

Use self control and discipline. Resist the impulse to shoot, even if it means losing a fine animal. You will have maintained and demonstrated the control that distinguishes a true sportsman.

POSITIVE TARGET IDENTIFICATION

Attitude

One of the most important aspects in identifying the target has nothing to do with animals at ail. This factor is the emotional state and attitude of the hunter—the eagerness and tension that may cause you to shoot without properly determining the target.

The confidence and relaxation of an experienced hunter are the result of experience. Self control and experience are the best guides for the young or inexperienced hunter. Knowing the sorts of pressures you will face as a new hunter can prepare you in understanding and overcoming these feelings.

As a novice hunter, you will face a number of problems. You are unfamiliar with your surroundings. You may be frustrated by an inability to spot game with the same ease as more experienced companions. You may feel that you must kill an animal to be a success. These factors, combined with lack of confidence, may cause you to fire at the slightest suggestion of sound or movement and make you believe that you see features not actually there. How can you overcome this?

The secret is self discipline. The true sportsman appreciates that the safe and ethical conduct of the hunt is the major aspect of the hunting experience, and that it takes precedence over "success" in shooting. He will not, therefore, jump at the chance to kill game if it means that he will, in so doing, spoil the experience by endangering or offending others.

An experienced sportsman does not become involved in accidents and violations through overeagerness. He is relaxed and confident in the knowledge that the conduct of the hunt and the pleasure of the outdoor experience are the most important aspects and, at the same time, the most easily attainable ones.

You should realize that experienced hunters are much more impressed by the young hunter who conducts himself well than by one who shoots at the expense of safety and courtesy.

Slow down. Look carefully, then look again. The few seconds taken to positively identify your target will pay off not only in safety but in enjoyment, accuracy, and success.

Target Identification

Target identification starts before your hunting trip begins. The excitement of a hunt can make it difficult to be completely objective about what you think you see. Being objective about your target is impossible if you do not know what you are looking for or where to find it.

Learn the appearance, characteristics, and habits of the animals that you are hunting, as well as those of other animals that may be in the same area. This will:

Allow you to positively identify the animal you are hunting;

Enable you to determine if it is the correct species, legal age, and sex;

Allow you to understand where you will be likely to find the species you are after, and where it will likely not be. Be suspicious of an "animal" in an unlikely place or habitat.

Prevent needless killing of harmless animals that may appear threatening to a person ignorant of their behaviour and habits.

Identification Strategy

An identification strategy is a series of steps or checks you must go through to positively identify your target.

Don't be fooled by a flash of colour or a sudden movement. Your imagination and excitement may make you see more than is really there. A moving patch of brown may be a deer—or a domestic animal—or another hunter. Even if it is a deer it may not be the proper age or sex to make it legal game.

Don't assume that other hunters follow the safe practices that you do. You will wear bright coloured clothing to be visible to other hunters, but they may not do the same. Always be prepared for the unexpected.

Don't squeeze your trigger until the entire animal becomes visible. This will let you positively identify exactly what you are shooting at. Look for unique features or characteristics that can belong only to the animal you are hunting. The hunter who looks for specific features rather than general colours or movement is the one who will never make an incorrect identification.

Check List: ***Look, then look again.***

1. Is it the right kind of animal?
2. Is it of legal age and sex?
3. Is the shot clear to the target and beyond?

Remember that other hunters have the same identification problems that you do. Protect yourself by wearing bright clothing wherever possible.

Never carry a deer or other game on your shoulders unless you attach a flag or other marker to let other hunters know you are underneath.

DANGER BEYOND THE TARGET

Any firearm can be deadly if you don't take into account what may be behind your target. A rifle can be dangerous at a range of several miles. Most accidents, however, occur at close range.

1. Never fire toward the surface of lakes, rivers or ponds. A bullet can skip like a flat stone and cause damage in an unexpected direction.

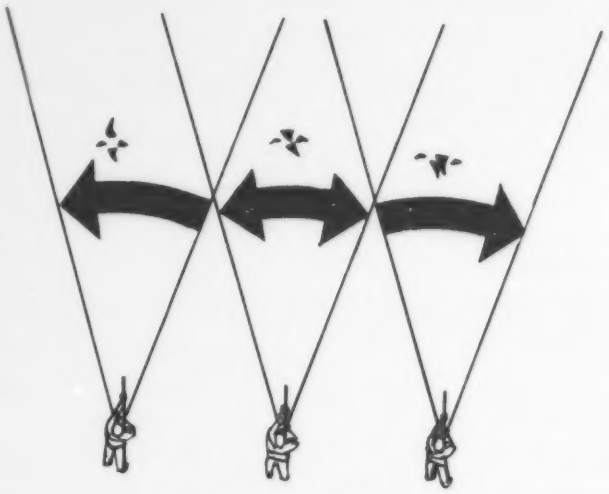
2. Never fire over the crest of a hill, into brush or woods, or anywhere else where you cannot see what may be hidden behind the target.

3. Never fire toward rocks or other hard surfaces where the bullet may deflect or ricochet.

Zones of Fire

You must establish *zones of fire* so you will not endanger your companions when you shoot. Discuss and plan with your companions where you will be in relation to them, determine your zones of fire, and only shoot within your zone. If you do not, you could shoot one of your companions. If you are hunting game birds, position yourself in a line facing the same direction with a safe distance between you and the hunter. Each hunter will shoot only those birds that fly in the space in front of him. No one should shoot into or across another's zone.

If you are hunting big game and decide to separate from your companions, determine your planned destinations and the directions you will each travel before you go. This will help to establish your zones of fire. Every member of the hunting party must know the zone of fire of the others to avoid entering them, or shooting into them.



IDENTIFICATION REVIEW

1. What three basic questions should you ask yourself before you shoot?

2. What steps should you take to identify your target?

3. List two dangers that may exist behind your target.

Once the energy of your ammunition has been determined, the following guidelines are suggested for judging its killing power for various game animals.

Energy Required at Point of Impact

Target Species	Minimum	Adequate	Preferred
Deer, antelope, sheep, goat	900 ft. lb.	1200 ft. lb.	1500 ft. lb.
Elk, bear up to 600 lbs.	1500 ft. lb.	2000 ft. lb.	2500 ft. lb.
Large bear, moose	2100 ft. lb.	2800 ft. lb.	3500 ft. lb.

BALLISTICS Centrefire Rifle Cartridges

Description	Bullet Weight in grains	Bullet Type	Velocity Feet per second					Energy		
			Muzzle	100 Yards	200 Yards	300 Yards	400 Yards	500 Yards	Muzzle	100 Yards	200 Yards
223 Rem.	55	Pointed Soft Point	3240	2747	2304	1905	1554	1270	1282	921	648
	55	Hollow Point	3240	2880	2550	2240	1950	1680	1280	1010	790
243 Win.	75	Pointed Soft Point	3350	2924	2536	2180	1854	1563	1869	1424	1071
	100	Pointed Soft Point	2960	2697	2449	2215	1993	1786	1945	1615	1332
25/06 Rem.	120	Pointed Soft Point	2990	2730	2484	2252	2032	1825	2382	1985	1644
250 Savage	100	Pointed Soft Point	2820	2467	2140	1839	1569	1339	1765	1351	1017
7 mm Mauser	160	Kling-Kor Soft Point	2520	2213	1928	1668	1438	1248	2256	1740	1320
30/30 Win.	150	Kling-Kor Soft Point	2390	2018	1684	1398	1177	1036	1902	1356	944
	150	Sabretip	2390	2018	1684	1398	1177	1036	1902	1356	944
	170	Kling-Kor Soft Point	2200	1895	1619	1381	1191	1061	1827	1355	989
	170	Sabretip	2200	1895	1619	1381	1191	1061	1827	1355	989
300 Win. Magnum	150	Pointed Soft Point	3290	2951	2636	2342	2068	1813	3605	2900	2314
	180	Sabretip	2960	2745	2540	2344	2157	1979	3501	3011	2578
303 Savage	190	Kling-Kor Soft Point	1890	1612	1372	1183	1055	970	1507	1096	794
308 Win.	110	Pointed Soft Point	3180	2666	2206	1795	1444	1178	2470	1736	1188
	150	Pointed Soft Point	2820	2533	2263	2009	1774	1560	2648	2137	1705
	150	Sabretip	2820	2533	2263	2009	1774	1560	2648	2137	1705
	180	Kling-Kor Soft Point	2620	2259	1928	1630	1374	1175	2743	2039	1485
	180	Sabretip	2620	2393	2178	1974	1782	1604	2743	2288	1896
	200	Kling-Kor Soft Point	2450	2208	1980	1767	1572	1397	2665	2165	1741
38-55 Win.	255	Soft Point	1320	1190	1091	1018	963	917	987	802	674

POPULAR USE CHART

Description	Bullet Wt. in Grains	Bullet Type	Deer	Black Bear	Antelope	Bighorn Sheep	Mountain Goat	Caribou	Moose	Elk	Grizzly Bear	Groundhog	Fox	Coyote	Wolf
223 Rem.	55	PSP										●	●	●	●
	55	HP										●	●	●	●
243 Win.	75	PSP											●	●	●
	100	PSP	●		●							●	●	●	●
25-06 Rem.	120	PSP	●	●	●	●	●	●					●	●	●
250 Savage	100	PSP	●	●	●			●					●	●	●
7 mm Mauser	160	KKSP	●	●		●	●	●	●	●	●				
30-30 Win.	150	ST-KKSP	●	●									●	●	●
	170	ST-KKSP	●	●				●							
300 Win. Mag.	150	PSP	●		●										
	180	ST				●	●	●	●	●	●				
303 Savage	190	KKSP	●	●											
308 Win.	110	PSP										●			
	150	ST-PSP	●	●	●	●	●	●					●	●	●
	180	ST-KKSP	●	●	●	●	●	●	●	●	●				
	200	KKSP	●	●				●	●	●	●				
38-55 Win.	255	SP	●	●											

Foot-Pounds			Short Range						Long Range						
300 Yards	400 Yards	500 Yards	50 Yards	100 Yards	150 Yards	200 Yards	250 Yards	300 Yards	100 Yards	150 Yards	200 Yards	250 Yards	300 Yards	400 Yards	500 Yards
443	295	197	+0.4	+0.8	0	− 2.2	− 6.0	−11.8							
610	460	345	+0.4	+0.7	0	− 1.9	− 5.1	− 9.9	+1.9	+1.6	0	− 3.3	− 8.5	− 26.7	− 59.6
									+1.7	+1.4	0	− 2.8	− 7.0	− 21.1	− 44.3
791	572	407	+0.3	+0.7	0	− 1.8	− 5.0	− 9.8							
1089	882	708	+0.5	+0.9	0	− 2.2	− 5.8	−11.0	+1.8	+1.4	0	− 2.7	− 7.0	− 21.5	− 46.1
									+1.9	+1.6	0	− 3.1	− 7.8	− 22.6	− 46.3
1351	1100	887	+0.5	+0.8	0	− 2.1	− 5.6	−10.7							
									+1.9	+1.6	0	− 3.0	− 7.5	− 22.0	− 44.8
751	547	398	+0.2	0	− 1.6	− 4.9	−10.0	−17.4							
									+2.4	+2.0	0	− 3.9	− 10.1	− 30.5	− 65.2
988	735	553	+0.3	0	− 2.1	− 6.2	−12.7	−21.9							
									+1.4	0	− 3.4	− 9.2	−17.7	− 44.5	− 88.3
651	461	357	+0.5	0	− 2.6	− 7.7	−16.0	−27.9							
651	461	357	+0.5	0	− 2.6	− 7.7	−16.0	−27.9	+1.7	0	− 4.3	−11.6	−22.7	− 59.1	−120.5
720	535	425	+0.6	0	− 3.0	− 8.9	−18.0	−31.1	+1.7	0	− 4.3	−11.6	−22.7	− 59.1	−120.5
720	535	425	+0.6	0	− 3.0	− 8.9	−18.0	−31.1	+2.0	0	− 4.8	−13.0	− 25.1	− 63.6	−126.7
									+2.0	0	− 4.8	−13.0	− 25.1	− 63.6	−126.7
1827	1424	1095	+0.3	+0.7	0	− 1.8	− 4.8	− 9.3							
2196	1859	1565	+0.5	+0.8	0	− 2.1	− 5.5	−10.4	+2.6	+2.9	+ 2.1	0	− 3.5	− 15.4	− 35.5
									+1.9	+1.6	0	− 2.9	− 7.3	− 20.9	− 41.9
591	469	397	+1.0	0	− 4.3	−12.6	− 25.5	− 43.7							
									+2.9	0	− 6.8	−18.3	− 35.1	− 86.2	−172.5
787	509	339	+0.5	+0.9	0	− 2.3	− 6.5	−12.8							
1344	1048	810	+0.2	0	− 1.5	− 4.5	− 9.3	−15.9	+2.0	+1.8	0	− 3.5	− 9.3	− 29.5	− 66.7
1344	1048	810	+0.2	0	− 1.5	− 4.5	− 9.3	−15.9	+2.3	+1.9	0	− 3.6	− 9.1	− 26.9	− 55.7
1062	754	552	+0.3	0	− 2.0	− 6.0	−12.3	−21.4	+2.3	+1.9	0	− 3.6	− 9.1	− 26.9	− 55.7
1557	1269	1028	+0.2	0	− 1.8	− 5.2	−10.4	−17.7	+3.0	+2.5	0	− 4.8	−12.4	− 36.1	− 82.2
1386	1097	867	+0.4	0	− 2.1	− 6.3	−12.6	−21.4	+2.6	+2.1	0	− 4.0	− 9.9	− 28.9	− 58.8
									+1.4	0	− 3.1	− 9.0	−17.2	− 42.1	− 81.1
587	525	476	0	− 4.7	−15.4	−32.7	− 57.2	− 89.3							
									0	− 8.4	−23.4	− 45.6	− 75.2	−158.8	−277.4

RIFLE SHOOTING POSITIONS

Prone Position

The prone position is the steadiest shooting position and the one from which the fundamentals of rifle shooting are best learned. It is a good position for firing accurate long distance shots. But it is usually not suitable when hunting in tall grass or dense brush which can obscure the line of sight to the target.

If you are right-handed, lie on your stomach with your body slightly to the left of the line of aim. If you are left-handed, reverse this position. Keep your back straight and legs in a relaxed position. Both elbows should be bent and your shoulders curved slightly forward to form a solid upper body position. The upper body and arms support the rifle weight.

Kneeling Position

Because the shooting arm is free, this position leaves the shooting arm and elbow unsupported and is not as steady as either the prone or sitting positions. But with practice, the shooter can maintain control and shoot accurately.

Turn so you are approximately at a 45 degree angle to the target. Lower your body so the right knee touches the ground and place your left foot forward to steady you. Sit comfortably on the heel or the side of the right foot. Place the left elbow near but not on the bony part of the left knee, as far under the rifle as you can.

If you are a left-handed shooter, kneel on the left knee with the right foot forward and the right elbow on the bent knee.

Sitting Position

The sitting position is the next steadiest shooting position. Both short and long range shots can be fired accurately from this position.

Sit solidly on the ground. The legs may be crossed or open and the body should be positioned about 30 degrees to the right of the one of aim.

Place the left elbow near but not on the bony part of the left knee. As in the prone position, tuck the elbow as far under the rifle as possible. Place the right elbow on or near the right knee. You have now formed two triangles which make a firm support for the rifle. Reverse the procedure if you are a left-handed shooter.

Hold the rifle firmly but do not grip it tightly. Bracing your body against something stable such as a tree or rock will help steady your aim for a more accurate shot.

Standing Position

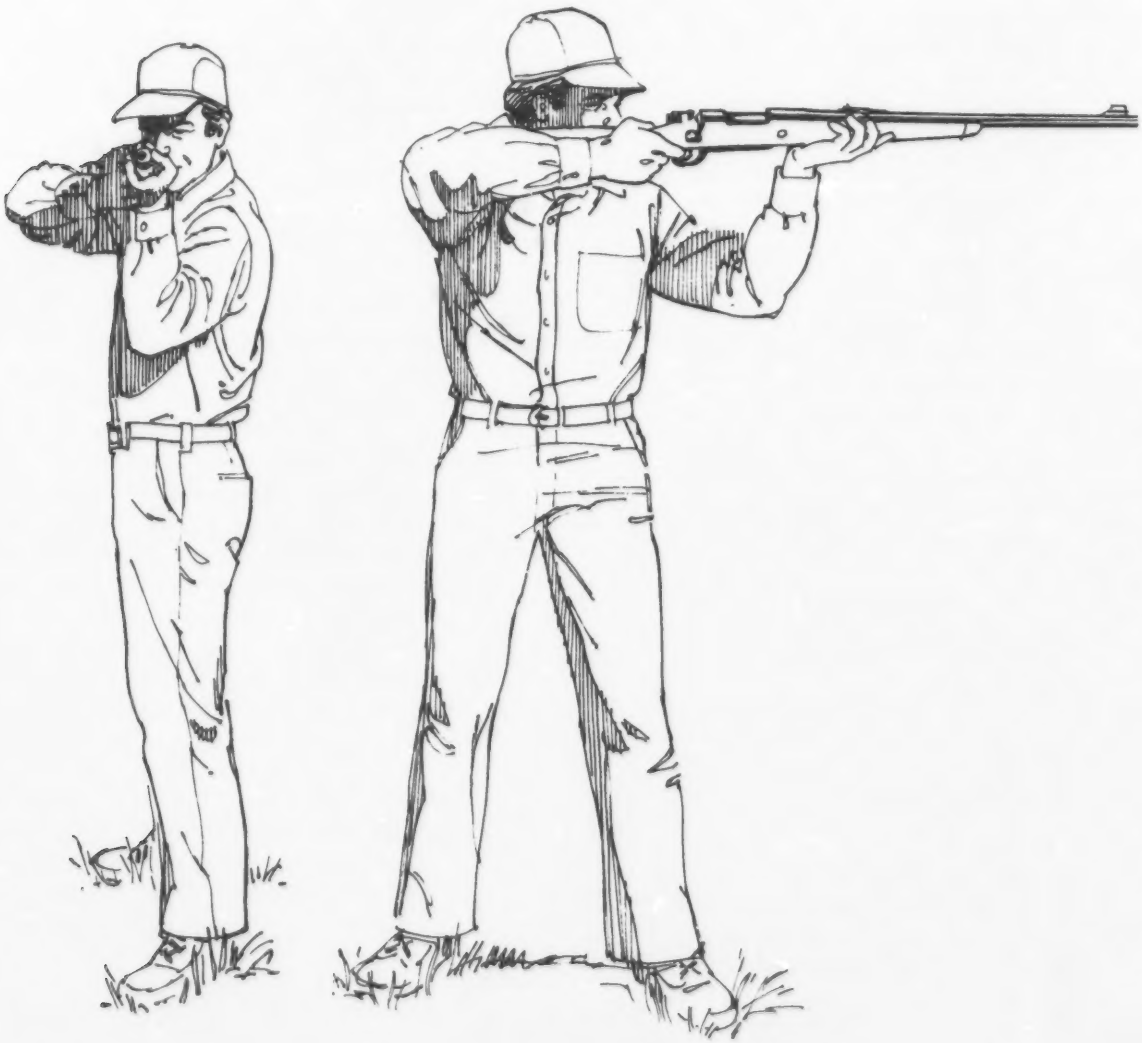
The standing position is the most unstable shooting position. It is also the most difficult position from which to fire an accurate shot.

It requires excellent control. The shooter must be skilled in all of the rifle shooting fundamentals — sighting, breath control, trigger squeeze and follow through.

Turn your body approximately 90 degrees to the right of the target. Place your feet shoulder width apart.

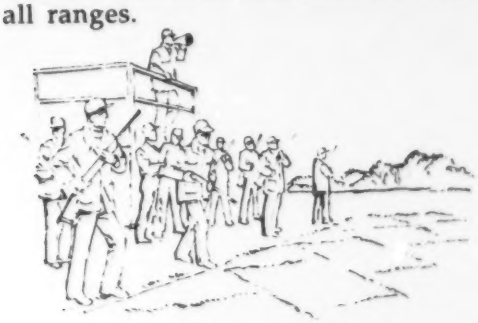
Support the rifle with your left arm. Hold the left arm against your body for extra support. Hoid the rifle firmly against your shoulder with the right hand. Do not grip the rifle tightly. Reverse the procedure if you are a left-handed shooter.

If there is too much waver, do not shoot. Resting or supporting the rifle on a stable object such as a tree or large rock, or using a carrying strap as a sling, will help steady your shot.



RANGE PROCEDURE

Range procedure will vary slightly from range to range but there are some fundamental rules that must be obeyed at all ranges.



1. Always obey all instructions of the Range Officer (RO).

2. Never allow your firearm to point in any direction but down range.

3. Never leave a loaded firearm unattended. Whenever you leave your firearm for any reason, make sure it is empty and open, or in your gun box or case.

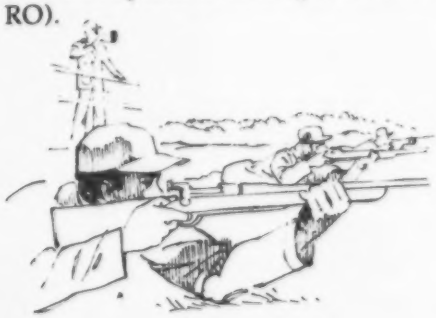
4. Do not load or fire your firearm without instructions from the Range Officer. Instructions will be similar to:

a. "Shooters on the firing line" (take your position on the firing line).

b. "Is the line ready?" (if you are, do nothing). If it is not, the RO will say "The line is not ready"; when the problem is corrected "Is the line ready?" will be asked again.

c. "Load" tells you you can load your firearm.

d. "Commence firing" (you can now shoot at your own speed or at a speed stated by the RO).



e. "Cease firing" (you must stop firing. If you have a cartridge in the chamber and are aiming at the target you may fire, then immediately unload, open your firearm and set it down).

f. If a problem arises or you are unsure of anything, raise your arm to call the RO. Make sure that when you raise your arm you maintain control over the muzzle, pointing it down range.

5. Be courteous to other users of the range. Keep the area clean and don't leave used targets or empty boxes lying around.

FUNDAMENTALS OF SHOTGUN SHOOTING

Shooting a shotgun is different from shooting a rifle. With the rifle you must aim precisely. With a shotgun you "point" at the target. Because of this, the fundamentals of shotgun shooting are different.

Accurate shotgun shooting requires a fast sequence of movements involving the body, gun and eyes. These movements need to be performed in one smooth, co-ordinated movement for accuracy.

There are some shotguns which are equipped with adjustable sights and some models that fire slugs. These types use the same shooting techniques required for accurate rifle shooting.

Shotgun Shooting Stance

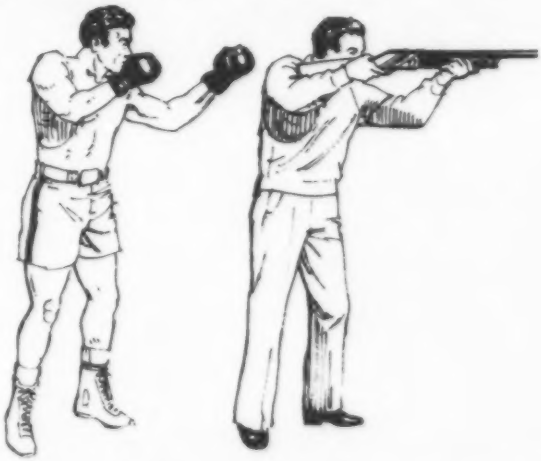
The shotgun shooting position or "stance", resembles that of a boxer in the ring — feet spread apart, well balanced, arms and trunk free to swing to the right and the left of the target. This position must be comfortable and natural to allow quick movement in any direction.

When shooting, the body weight shifts to the leading leg (left leg if you shoot right-handed, right leg if you shoot left-handed). The leading hand holds the shotgun fore-end and points naturally to the target area.

You don't aim the shotgun — you "point" it at your target.

Mounting the Shotgun

The action of placing the shotgun to your sl.oulder is called "mounting the gun". You must place the stock against your cheek first, then against your shoulder. This makes sure the gun is in exactly the same position each time you shoot.

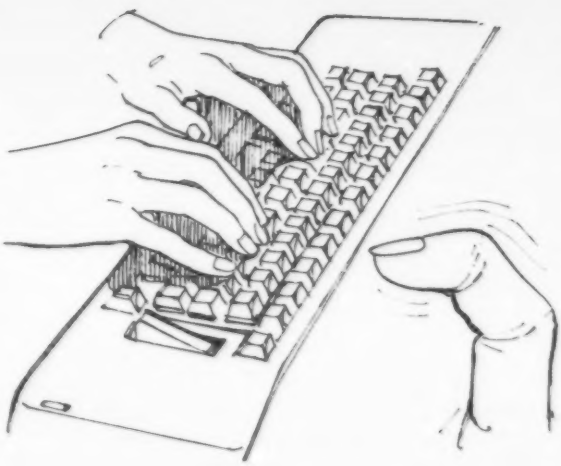


Do not make the error of raising the gun to the shoulder first and dropping your head so the cheek rests against the stock. When this happens, you may make several shooting errors, which will likely cause you to miss the target.

Eyes on the Target

Keep both eyes wide open and focussed on the moving target — not on the gun barrel or the bead sight. While watching the target, mount the gun correctly and point it toward the target area.

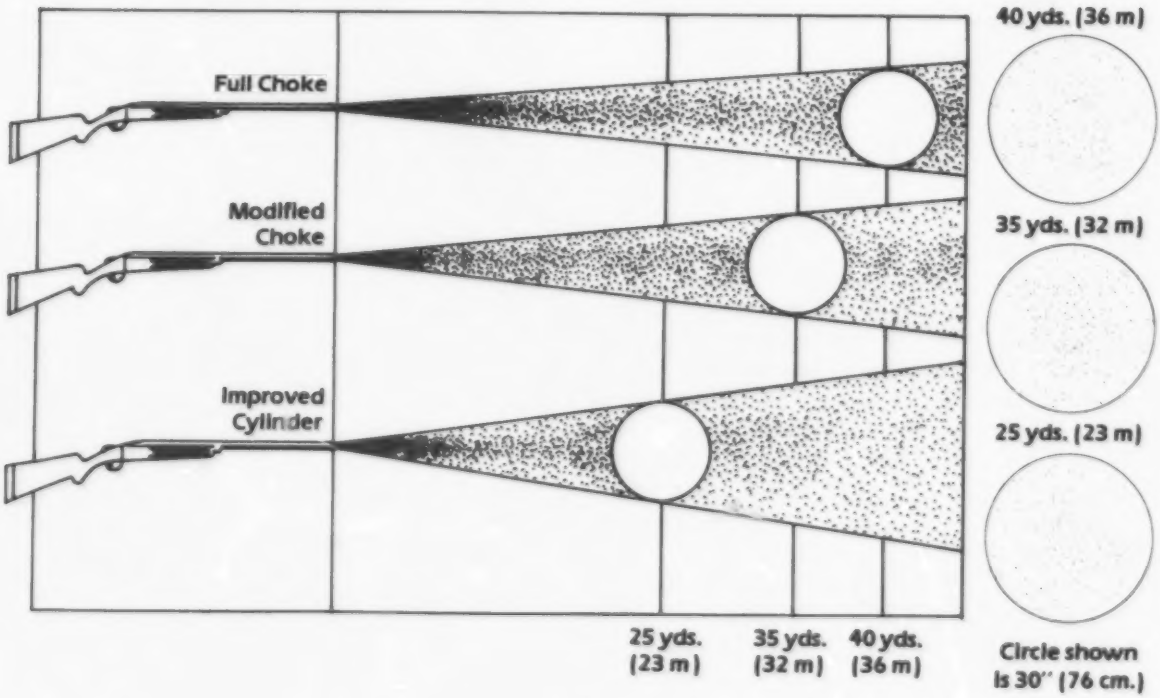
Remember, you do not aim a shotgun, you simply point it.



Slap the Trigger

You do not fire a shotgun with slow, steady trigger pressure as you do a rifle. The shotgun trigger is consciously "slapped". The trigger slap is similar to the action of striking a typewriter key. Slap the trigger quickly, but not hard.

Chokes and Shot Patterns



Leading

"Leading" means shooting ahead of the moving target. Leading is necessary when shooting at any moving target. If you shoot directly at a moving target, by the time the shot reaches that spot, the target will have already passed by. With correct lead, the shot and the moving target will reach the same spot at the same time.
With practice, the leading will soon become automatic, requiring no conscious thought on your part.

There are three commonly used methods of leading - "swing through", "sustained lead" and "snap shooting".

Swing Through Lead

For the beginning shooter, the swing through method is easiest to learn.

Swing the muzzle of the shotgun so it points at the flying bird. Follow its flight path, increasing the speed of your swing until the gun muzzle has passed through the bird to a spot just ahead — then fire. Continue your swing during the shot and after.

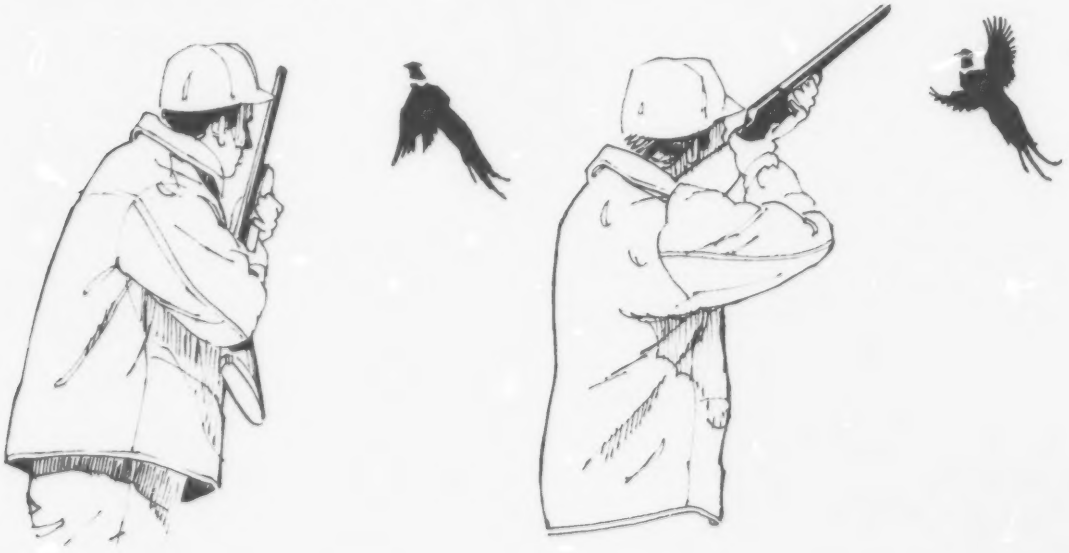
It is extremely important to continue swinging your shotgun after the shot. This is called "follow through". It ensures against shooting behind your target.

Sustained Lead

A shooter using the sustained lead technique must estimate the speed, range, and angle at which his quarry is flying. Having decided on the amount of lead necessary, he swings the muzzle that distance ahead of the target. He then maintains this distance, or lead, in front of the bird up to and after the shot is fired.

Snap Shooting

Anticipating the amount of time he thinks it will take a flying bird to get there, a hunter using the snap shot method picks a spot in front of his target and fires at that spot. He hopes that the shot and the target will meet at the same place.



BLACK POWDER AND MUZZLE-LOADING

Black powder hasn't been used to fire guns since early in this century. In recent years hunting with black powder firearms or muzzle-loaders has been revived.

Selecting Black Powder Firearms

Black powder enthusiasts will find a wide choice of firearms available today. There are muskets, pistols, muzzleloading rifles, and shotguns. Black powder shooting need not be expensive. A black powder gun costs about the same as a standard shotgun. Muzzleloaders can also be made from inexpensive do-it-yourself kits. If you do have an antique gun, before using it, have it inspected by a firearms expert to be sure it can be fired safely.

With percussion cap models, the breech plug should be removed and the nipple, drum, and threads checked for rust and deterioration.

Special attention must be given to antique black powder shotguns. If they are corroded, they are not safe to fire. Antique shotguns, especially those with Damascus barrels, are particularly susceptible to corrosion.

Today, the safest guns for black powder use are reproductions of muzzle-loaders.

Before buying a black powder gun, the newcomer to the sport should first attend several black powder shoots as a spectator. Talk with the participants and learn why they like a particular model. A gun which is good for target shooting is not necessarily the best model for hunting. Know the gun's capabilities and those functions which it can perform before purchasing a black powder firearm.

If you intend to hunt big game with your black powder gun, give consideration to the size of calibre you choose.

Selecting Powder and Ball

Muzzleloaders require different loads for hunting and for target shooting. There are four types of black powder, Fg, FFg, FFFg, and FFFFg. Each type has a different burning rate depending on the coarseness or size of the powder granules.

Fg is very coarse and is the ammunition used to fire muskets with large bores.

Most muzzleloading shotguns, big bore rifles and pistols between .54 and .69 calibre fire FFg, the second coarsest powder available.

A faster burning black powder is FFFg. It is the powder used with most cap and ball revolvers, single shot pistols and rifles ranging from .36 to .54 calibre.

FFFFg is very fine powder and is seldom used except when priming flash pans of flintlocks. It is extremely fast burning and

creates pressures too great for most black powder guns.

Most muzzleloading rifles fire round lead balls or conical shaped bullets called mini-balls.

Tables showing the correct bullet diameter, powder type, and charge in grains for various black powder guns are listed in most publications about black powder shooting.

Selecting Accessories

The black powder shooter must have certain shooting accessories close at hand.

(a) ***Patching Material*** - linen or cotton fabric (not synthetic) cut into individual patches or one inch wide strips. Vaseline or shortening to lubricate the bullet and a knife to trim the patches.

(b) ***Powder Horn or Flask*** - a container for powder made of material such as horn, brass or copper that will not generate sparks or static electricity.

(c) ***Powder Measure*** - a brass measuring scoop to ensure the correct powder charge is loaded.

(d) ***Starter*** - a short and long starter are usually combined in one tool. The short starter fires the ball firmly in the muzzle and the long starter is used to move the ball down the barrel.

(e) ***Ramrod*** - the ramrod is used to push the tight-fitting bullet down the length of the barrel.

(f) ***Ramrod Accessories***

Worm - a corkscrew tip on the ramrod used to remove cleaning patches which have stuck in the bore.

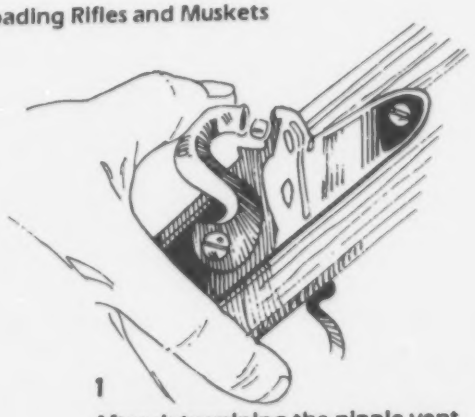
Ball screw - a tip on the ramrod used to remove the lead ball without discharging the firearm.

(g) ***Nipple Prick or Vent Prick*** - a length of wire slender enough to be inserted through the vent hole in a caplock or the flashhole in a flintlock to clear any fouling or obstruction. A nipple wrench should also be carried to replace a broken nipple.

(h) ***Cap Holder and Loading Block*** - The cap holder is a small strip or disc of leather punched with holes which will hold extra caps securely. The loading block holds pre-patched and lubricated balls.

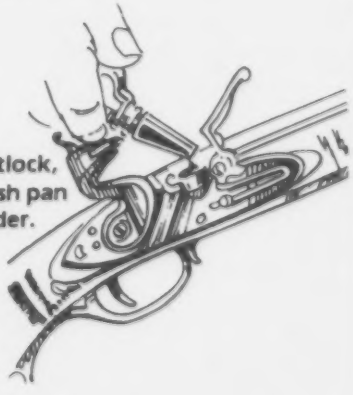
(i) ***Possibles Bag*** - A shoulder bag or pouch in which the necessary accessories are carried.

Loading Rifles and Muskets



1

After determining the nipple vent or flashhole is clear, place the hammer at half cock.



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In priming the flintlock, charge the flash pan with FFFFg powder.

Loading

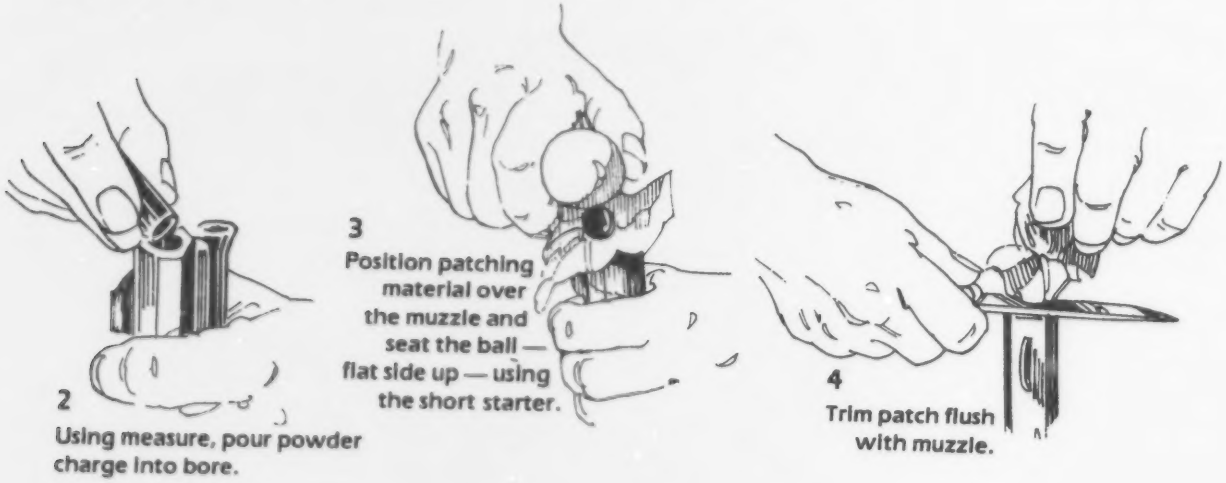
Before loading, the barrel of the muzzleloader should be wiped with a cleaning patch to remove any fouling or oil residue. The patching cloth is moistened with Vaseline, shortening or saliva, then wrapped around the ball forming a tight seal. With a sharp knife or razor, trim excess patching from around the ball after sealing.

To test a percussion cap firearm, fire a cap in the unloaded gun. If the gun is in good working condition, a small curl of smoke will come out through the barrel. Or, if the muzzle is held near a leaf or blade of grass, the puff of air which comes out of the barrel will move it.

To test a flintlock, prime the flash pan and flashhole with powder and touch it off with the muzzle pointing in a safe direction. Smoke should show from the muzzle.

If the nipple vent on the percussion cap gun or the flashhole on the flintlock appear to be closed, work the hole clear with a nipple prick.

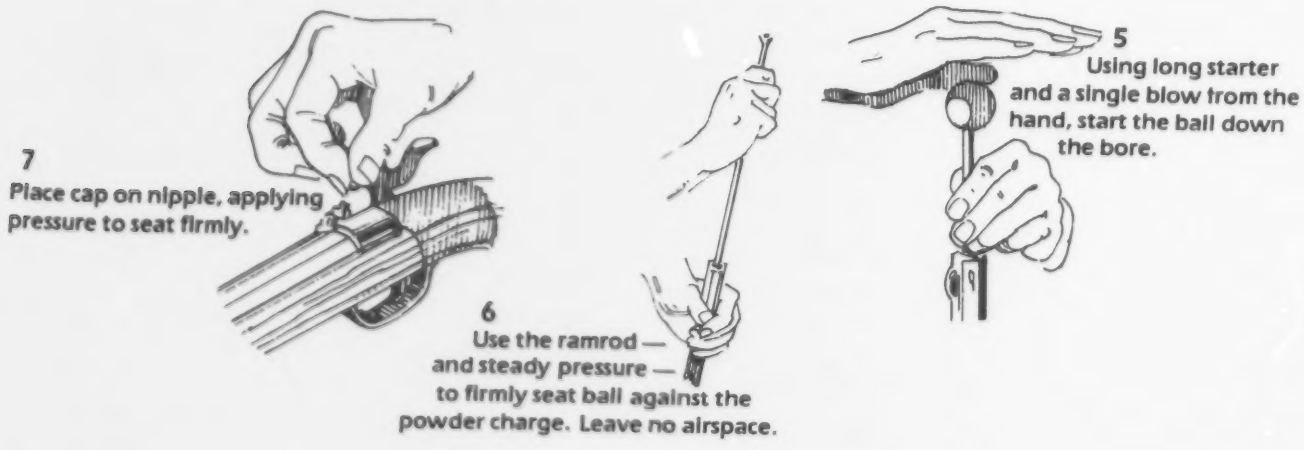
For convenience when on a hunting trip, pre-measured powder loads may be carried in small plastic pill containers, or in individual paper tubes twisted tightly at each end.



2 Using measure, pour powder charge into bore.

3 Position patching material over the muzzle and seat the ball — flat side up — using the short starter.

4 Trim patch flush with muzzle.



5 Using long starter and a single blow from the hand, start the ball down the bore.

6 Use the ramrod — and steady pressure — to firmly seat ball against the powder charge. Leave no airspace.

7 Place cap on nipple, applying pressure to seat firmly.

Safety Considerations

1. Muzzleloaders must be handled with the same care afforded other firearms.

2. Muzzleloaders are to be used with black powder only. Never use a smokeless powder. Black powder is highly combustible and can be ignited by a small spark. Never smoke near black powder and be sure to store black powder far from any open flame such as a campfire.

3. Never pour powder from the horn or flask directly into the muzzle. After a shot has been fired, smouldering residue often remains in the barrel, which could cause an explosion or backfire into the powder container.

4. Hold the muzzle away from the body when loading. This will protect you from burns if the powder is accidentally ignited.

5. Be certain the ball is seated firmly in place. To shoot with a ball lodged midway down the barrel will damage the gun and could severely injure the shooter.

6. Wipe the bore with a damp patch after each firing.

7. It is important to know when a gun is loaded. Experienced muzzleloaders mark the gun's ramrod at levels which show the bore depth when the bore is empty, when charged with a heavy hunting load. When the ramrod is inserted in the barrel, it is immediately apparent whether or not the gun is loaded and if loaded, with how heavy a charge. This safety precaution is especially important.

OTHER RECREATIONAL SHOOTING ACTIVITIES

It is important that a beginning hunter have a high level of shooting proficiency before he goes hunting. It is also important that he know his firearm is sighted in accurately and that he know how to handle and operate it safely. It is too late to find these things out when in the field hunting. They must be determined beforehand. The best way a hunter can accomplish this is to participate in other forms of recreational shooting activity before the hunting season. These activities can be done year round. Some activities may be done during the years before a person is legally old enough to hunt. Doing a lot of supervised shooting at this time, will help to overcome the urge to do a lot of indiscriminate shooting when he first goes into the field hunting.

Plinking

Some people enjoy shooting just for the fun of it. They spend many hours "plinking" at tin cans, targets or pest species of wildlife such as gophers. But just like hunters, people who go plinking have certain responsibilities. They must ask permission to shoot on private property, they must pick up and remove targets when the shooting is finished, and they must be concerned about safety. Thoughtless, inconsiderate plinkers are not welcome anywhere. One problem that greatly concerns landowners is plinkers who shoot glass bottles and leave the broken pieces lying around where they may injure livestock or damage tires.

Before going plinking:

1. Find out if plinking is lawful in the area.

2. Obtain permission from the landowner.

3. Know what wildlife are classified as pest species which may be shot while plinking and which species of wildlife are protected.

4. Check first with the Fish and Wildlife Division or local police department to determine local laws governing the carrying and discharge of firearms.

Before You Shoot:

1. Be sure there is a safe backstop behind your target.

2. Be sure the noise from your shooting will not annoy neighbours or passersby!

After You Shoot:

1. Be sure you have cleaned up your shells, targets, and other trash.

2. Leave all gates as you find them and report any open gates to the landowner when leaving.

3. Thank the landowner.

Guns for Plinking

The .22 rimfire rifle is the most popular choice for plinking. Although this firearm has many features which make it suitable for this purpose, there are several factors which should be considered.

Positive Features

(a) inexpensive to shoot
(b) makes little noise
(c) does not recoil when fired.

Negative Features

(a) Because it has no recoil and it's quiet, shooters tend to forget that a loaded .22 rimfire can be a dangerous and lethal firearm in the hands of the inexperienced and careless.
(b) The low velocity, all lead bullet has a tendency to ricochet after impact.

A better and safer choice for plinking is a .22 center-fire such as the .222 Remington. It has a louder noise. However, this high speed bullet will disintegrate on impact, thereby eliminating the possibility of a ricochet. Air rifles and pellet guns are sometimes used for plinking. Some air rifles and pellet guns are classified as firearms, and are subject to laws governing firearm use.

NOVELTY SHOOTING SPORTS

Novelty shoots are shooting activities that, unlike plinking, are organized and supervised by an experienced range officer and conducted on a range or area designated as a safe shooting area.

Turkey Shoot

One of the most popular of all novelty shoots is the "turkey shoot". Often held at Thanksgiving or Christmas, the local turkey shoot draws sportsmen of all ages to the target range to test their skill and try their luck at bringing home a prize. Contestants win prizes either for their markmanship or their luck in winning a draw.

Turkey shoots may be held indoors on short ranges or outdoors on longer target ranges.

.22 Sporting Rifle Match

These matches are held either indoors or outdoors and may be held on a target range of any distance. Contests are judged on either 10 or 20 shots with a .22 calibre rimfire sporting rifle fired from the standing (offhand) shooting position.

The .22 sporting rifle used must not weigh more than seven pounds including sights. The trigger pull must not be less than three pounds and only iron sights are permitted.

All other shooting aids and accessories are prohibited. The shooter with the highest markmanship score wins.

Air Gun Match

Air gun matches are usually held indoors on short ranges where space is limited and sturdy backstops are not available. Contestants use air guns (spring, pneumatic or $C0_2$ powered).

Bingo Target Match

Bingo matches can be held on any firearms range using .22 rimfire rifles or air guns.

Bingo cards are used as targets for this novelty match. Each competitor attempts to score a "bingo" by firing five shots in a straight line across the bingo card. The shooter who does so wins.

Miss and Out Match

The Miss and Out match is fired using shotguns on a standard 16 yard trap range. Contestants may shoot with their own shotgun but are required to use ammunition provided by the organizers in charge of the match. For the match, each contestant is issued one box of shotshells and 25 clay birds.

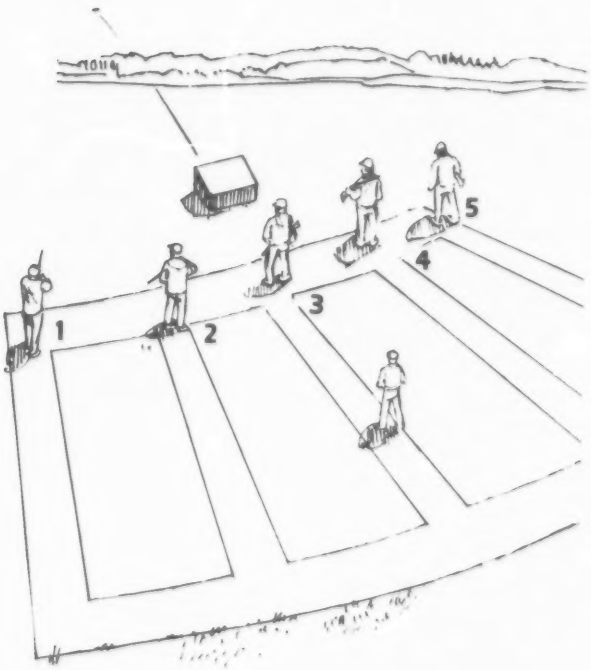
The match is played much like a trap shoot except when a shooter misses a bird he is eliminated. The last man to drop out is the winner.

REGULATION SHOOTING SPORTS

Shotgun Sports

Trap

Trap is a shotgun shooting sport which requires the gunner to try to hit targets thrown from a machine. Each shooter fires at five targets from each of five different shooting stations. A trapshooting round is made up of 25 birds (or 25 pairs when shooting doubles). The targets are thrown from a trap house at various angles anywhere within the 94 degree field. The shooter does not know what the target's angle of flight will be. In doubles, two birds are thrown at the same time.



Skeet

In skeet, the shooter fires at a target thrown from a high house and then one from the low house.
A round of skeet consists of 25 birds. The birds always fly in the same path. The field layout consists of eight shooting stations.

This accounts for 24 shots. One other shot is a repeat of the first miss or, if no miss has occurred, the 25th shot must be made from station 8 at a target from the low house.

Rifle Sports

Metallic Silhouette Match

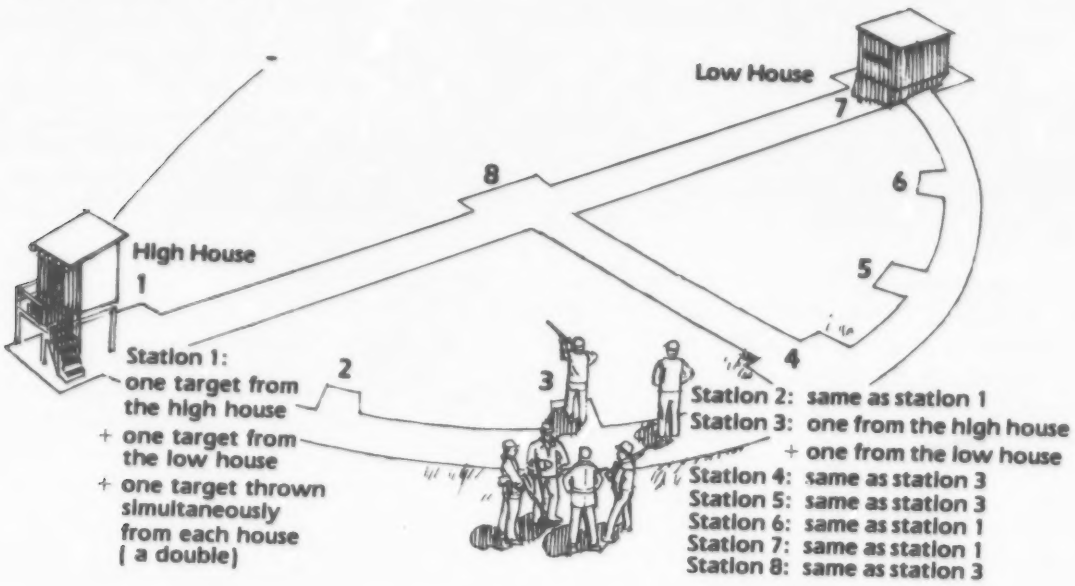
This sport requires the shooter to hit target silhouettes of various game species using a hunting rifle. All shooting is done from a single station and from a standing position.

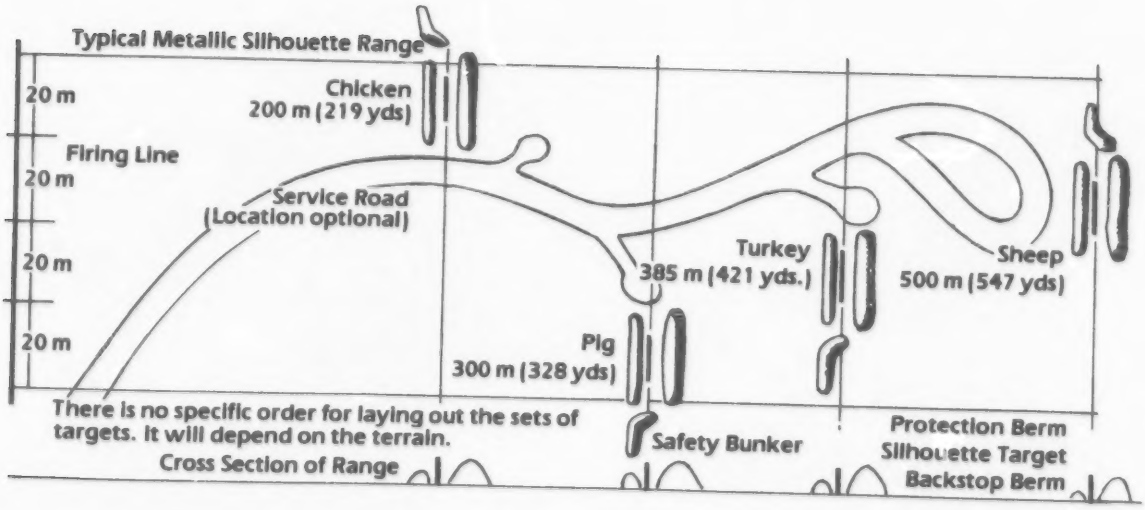
Targets are positioned as follows:

(i) Mountain sheep at 500 metres
(ii) Wild turkey at 385 metres
(iii) Wild pig at 300 metres
(iv) Grouse at 200 metres

As indicated by the target species, this sport was developed in Mexico where wild pigs and wild turkeys are game animals.

A skeet round consists of:


Low House
High House
1
2
3
4
5
6
7
8
Station 1:
one target from the high house
+ one target from the low house
+ one target thrown simultaneously from each house (a double)
Station 2: same as station 1
Station 3: one from the high house
+ one from the low house
Station 4: same as station 3
Station 5: same as station 3
Station 6: same as station 1
Station 7: same as station 1
Station 8: same as station 3



ARCHERY

Archery is defined as the art, practice or skill of shooting with a bow and arrow. Bowhunting is the sport of hunting game using archery equipment.

Bowhunting does not require great strength. Co-ordination and control are more important than muscle power. However, these skills can only be acquired through practice.

The equipment required for bowhunting need not be expensive. Learning how to shoot a bow is easy. Nevertheless, it is best to have an experienced archer teach you the fundamentals.

To become a bow hunter, it is important to learn what the bow can do and what it cannot do. Learning the habits of game animals you expect to hunt and the ways to hunt them are equally important.

The bow hunter should not hunt game until he learns the fundamentals of bowhunting and is capable of making clean kills in the field.

Bows

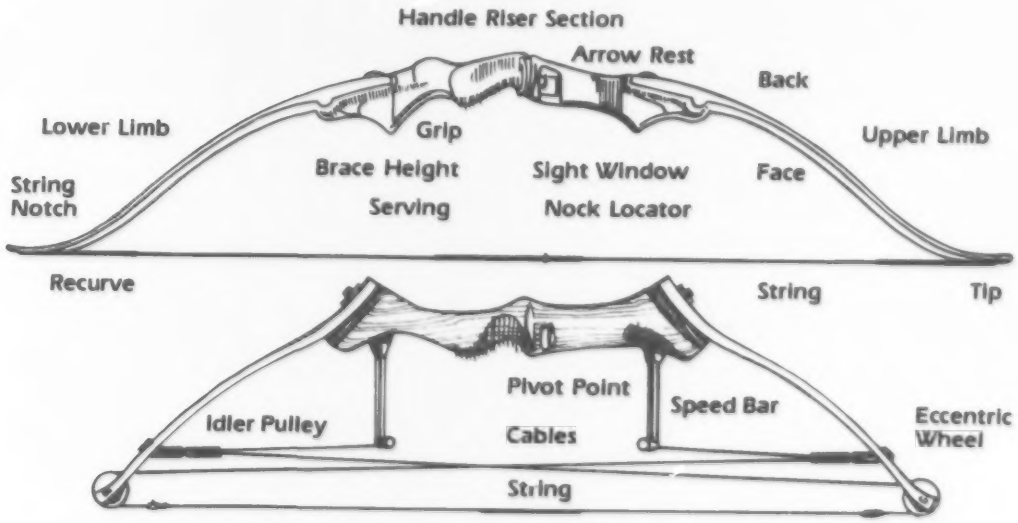
Bow Parts

The bow's handle is the middle portion called the *riser*. It includes the grip, arrowrest, and sight window.

The upper and lower sections of the bow are the *limbs*. They are light, very flexible and strong.

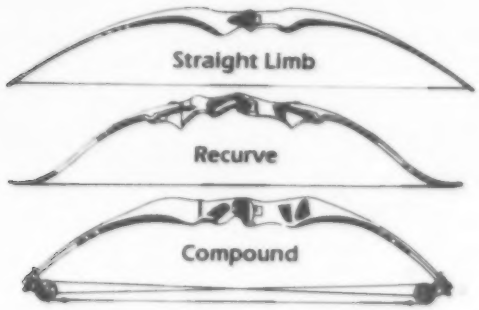
The outside surface of the limbs is the *back* and the *inside* is the face. An easy way to remember this: you are face to face when you draw a bow. The back is to the outside.

The bow *tips* are the extreme ends of the limbs. The distance between the grip and the bowstring, before the bowstring is pulled back to shooting position, is called the *brace height*.



Bow Design

There are three basic designs of bows: straight limb, recurve and compound.



Bow Construction

Bows may be made of a single material or a combination of several materials bonded together. If more than one material is combined to form the bow it is referred to as a *laminate* bow. Most bows today are laminate bows made from wood and fibreglass.

Bow Weight

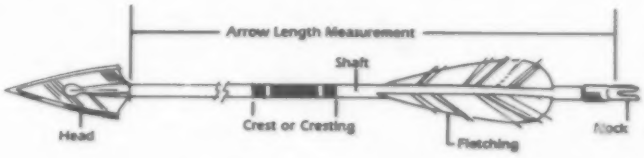
Bows also vary in their length and draw weight. *Draw weight* means the number of pounds of energy required to pull the bowstring to a distance of 28 inches (71 cm) from the back of the bow. For example, a 40-pound (18 kilo) bow is one that requires a pull of 40 pounds (18 kilos) to draw a 28 inch (71 cm) arrow to the arrowhead. The draw weight of a hunting bow may vary from 40 pounds (18 kilos) upwards.

Hunting bows are usually shorter than those used for target shooting because a short bow is easier to handle.

Arrows

Arrow Parts and Construction

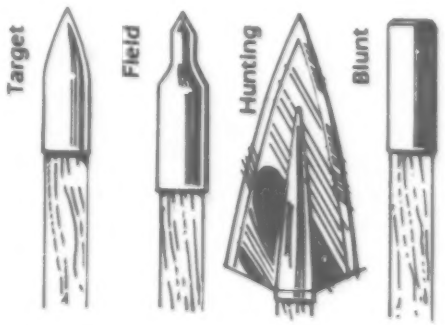
The basic parts of an arrow are the shaft, head, fletching, and nock.



Arrow *shafts* are commonly made from wood, metal or fibreglass. Although many types of wood can be used, most wooden shafts are cedar. Cedar is light in weight, straight-grained, and less susceptible to warpage than most woods. Wooden shafts are often preferred by hunters because they are inexpensive.

Both fibreglass and metal shafts are more expensive than wood, but they have several advantages. Because they are machine-made under rigid production controls, they are straighter and more uniform in diameter and weight. Shafts made of these materials are strong and will not warp.

Arrow *Heads*, or points, come in a variety of shapes; target point, field point, hunting point and blunt.



Bow hunting requires specialized heads. When upland game birds or other small game are the quarry, a blunt should be used. Blunts are also used in field practice.

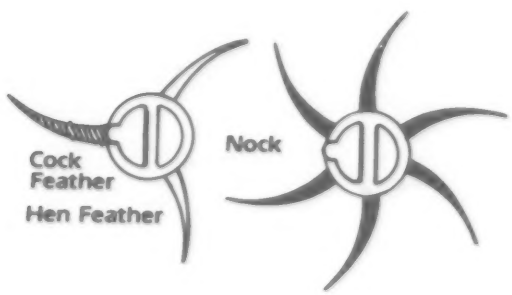
To hunt big game, broadheads are necessary. Broadheads are made of steel and come in several different shapes with a number of blades, all designed for maximum penetration of the animal. In Alberta, the law requires a bow hunter after big game to use a broadhead at least one inch wide or a multi-bladed broadhead.

Beginning bow hunters should learn the safe, correct way to sharpen broadheads.

The *nock* and *fletching* are at the opposite end of the arrow from the head. The *nock* is the notch or small slit into which the bowstring fits when the arrow is drawn. It is usually made of plastic or nylon.

The *fletching* is made of turkey-wing feathers or plastic vanes. Its purpose is to guide and stabilize the arrow's flight. Increased stability can be contained by increasing the number of feathers on the shaft from the normal three.

One feather in the fletching is a different color than the others. It is called the *cock feather*. The other two are called hen feathers. When the arrow is nocked, the cock feather is at a right angle to the bowstring.



Spine

Spine is the stiffness of the arrow's shaft. Accurate shooting depends on using arrows which are spined correctly for the bow's weight.
When an arrow is released, the bowstring whips forward with such force on the arrow that the shaft bends around the bow handle before it straightens out in flight. If the shaft has a weak spine, it will bend too much when shot from a heavy bow. If the shaft is too stiff, or has too much spine for the bow, it won't bend enough. In either case, the arrow will veer off course.

Arrows are graded according to their spines. Bows having up to five pounds (2 kilos) difference in draw weight will use arrows with the same spine. For compound bows, arrows should be spined for the peak draw weight of the bow. For example, in bows having a peak draw weight of 60 pounds (27 kilos), use arrows graded as 60 to 65 pounds (27 to 29 kilos) spine.

When using a broadhead, increase your spine weight approximately 5 pounds (2 kilos).

Length

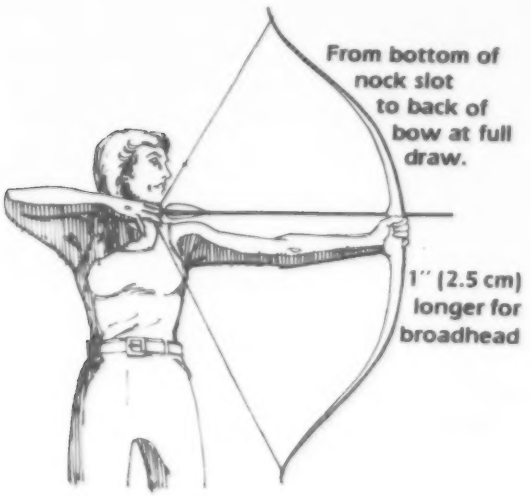
Arrow length is measured from the base of the arrowhead to the bottom of the nock slot.

Using arrows of correct length is important to safety as well as good shooting.

A practical method of determining the right length of arrow for you is to draw an extra long arrow on a very light bow until the length of draw is consistent and feels comfortable. While at full draw, have someone mark the shaft where it crosses the bow back. The distance from this mark to the bottom of the nock slot is the length of arrow you should use. If your draw length is 28 inches (71 cm), you should

select 28-inch (71 cm) hunting and 28-inch (71 cm) field arrows.

To avoid cutting your hand when drawing broadhead tipped arrows, select arrows one inch longer than your draw measurement. Arrows used for field shooting and hunting should be the same length. The field arrow is used for practice and should be as close as possible to your hunting arrow in weight, length and spine.



Arrow Selection

Matched arrows are a set of arrows having the same weight, shafts of equal stiffness and diameter, the same fletching and the same length. An arrow which differs from others in a set will fly differently from the others. Matched arrows are important for consistent shooting.

Bowhunting Accessories

In addition to a good bow and arrows, a bowhunter needs an *armguard* and a three-fingered *shooting glove* or *finger tab* to protect his forearm and fingers from the snap and pressure of the bowstring. The armguard is made of leather or vinyl and protects the arm against the lash of the bowstring when the arrow is released. It also keeps the archer's sleeve from getting in the way. The shooting glove or finger tab keeps the archer's three drawing fingers from being rubbed sore or blistered by the bowstring.

The *quiver* or arrow carrier is another essential accessory. Quivers come in three basic designs; back, hip, or bow quiver. The back or shoulder quiver is slung across the archer's back so the opening is just under the shoulder, putting the arrow's nock and fletching end within convenient reach.

The hip quiver, sometimes called the belt or pocket quiver, is usually used to hold field arrows.

Most bowhunters prefer the bow quiver which is clipped or screwed to the bow handle. This type is less likely to become entangled in brush, is fast, and quiet in the woods.

Other practical accessories are an extra bowstring, spare rest and tube of bowstring wax, a flat file and honing stone for sharpening broadheads, Allen wrenches, pliers for retrieving arrow points from trees and stumps, a bowstringer, string silencers and brush buttons, bowtip protectors, and some type of bow camouflage.

Bow Sights

Bow sights are not used by all bow hunters. Many prefer to use the point-of-aim technique. But for the beginning archer, a bow sight is one of the best aids in learning to aim accurately.

Bow sights come in many different designs. They can be simple and inexpensive, consisting of a single fixed or moveable pin, or they can be complicated and expensive, utilizing precision optical devices.

Most bow sights consist of a slotted bar fixed to the bow handle and an adjustable pin, bead or post, which can be moved up or down and from side to side. Some types use a prism or crosshairs and others have a series of pins which can be pre-set for various distances.

Bow Handling

Primary Safety Rules

Always check the condition of your equipment before using it.

Check your bow for cracks, twisted limbs, and broken or splintered bow tips.

Never draw and release a bow without first nocking an arrow. The strain this action puts on the bow limbs and string can damage the bow.

Check the bowstring, especially the loops, for any sign of wear. A bowstring with frayed strands is dangerous. Replace it immediately. Be sure the bowstring is firmly seated in the bow nocks.

Inspect all arrows for cracks and splinters. Never shoot an arrow with a damaged shaft. Cracked or loose nocks should be replaced. Look for loose or broken points and check the fletching for damage.

Never nock an arrow or draw a bow while facing someone.

Never draw an arrow and aim it at anything you don't intend to shoot, even in fun. Never aim a drawn bow at another person.

Never carry an arrow nocked in the bowstring. Sometimes bowstrings snap and plastic nocks break, accidentally causing the arrow to fly off. A stumble or fall might release the arrow, injuring one of your companions. Nock the arrow only when you are ready to shoot.

Be sure of your target. Never release an arrow without full view of the path to and beyond the target.

Never draw an arrow if someone is between you and the target or behind the target. An arrow can be deflected by a branch or twig and travel a considerable distance if it misses its mark. A bow hunter should never shoot at something that is not clearly visible. He should not shoot until he sees the entire animal, can identify it and pick a vital aiming spot.

In practice, always use a safe backstop or shoot into a sandbank or open hillside.

Never shoot an arrow straight up in the air.

What goes up must come down. If you shoot an arrow straight up to see how far it will go, you don't know where it will land. In falling, it can be extremely dangerous.

Always carry hunting arrows with points covered — for personal safety and the protection of companions

When carrying broadhead arrows be specially careful to use a protective covering or hood to prevent the razor sharp blades from cutting anyone.

Put your tackle away after use —to keep it in good condition and prevent accidents

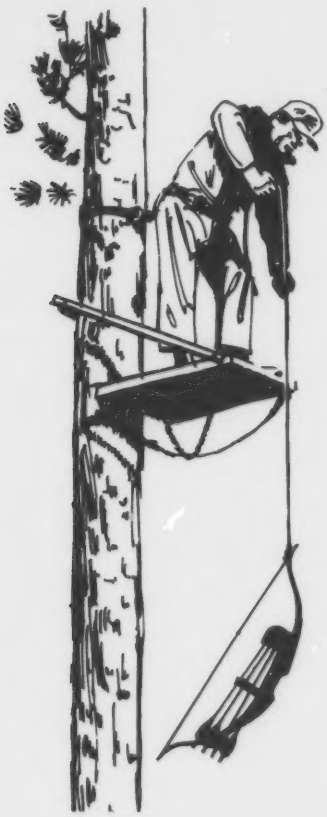
Never store your bow standing on end. Instead, hang it horizontally on a wall rack or vertically on a hook. Arrows should be stored in an arrow rack which helps keep them straight and prevents warping. Arrows should be stored in an upright position.

Safe Handling in the Field

When carrying broadheads in the field be especially on guard when climbing. If you are shooting from an elevated blind or tree stand, pull the bow and quiver up with a length of cord. Secure yourself to the tree stand with a safety line.

Always take an arrow out of your bow and place it in the quiver when not hunting. Never go into a camp, dwelling or group of people with your bow and arrow in shooting position.

Never use your equipment without having the basic rules of bow hunting safety uppermost in your mind.



Equipment Care

Care and Maintenance

A bow and arrows will give many years of service and enjoyment to the owner who gives them thoughtful care.

Fibreglass arrows are rugged and will not bend. Wooden arrows may warp. Aluminum arrows may bend if they hit a rock or tree stump. Check your wood or aluminum arrows to be sure they are straight. A light coat of furniture polish will protect wooden shafts and help prevent warping.

When an arrow hits a hard object, its point may be bent. Check to be sure the nock and head are properly aligned.

If an arrow's fletching is damaged, your shot will not be accurate. Make sure the feathers have not loosened or come unglued.

Keep your arrows clean. A little dirt on the head will change the weight of the point and cause a bad shot. Glass and metal arrows can be cleaned with a little soap and water.

Protect the bow's finish and keep out moisture by occasionally giving it a light coat of furniture polish.

Compound bows should be checked regularly to be sure all the bolts are tight. The idler wheels and cams should be oiled often and the cables checked for wear and replaced when necessary.

The bowstring should be waxed every time the bow is used. Wax will prolong the bowstring's life. Rub the wax well into the strands and remove any excess wax with a soft cloth.

Stringing the Bow

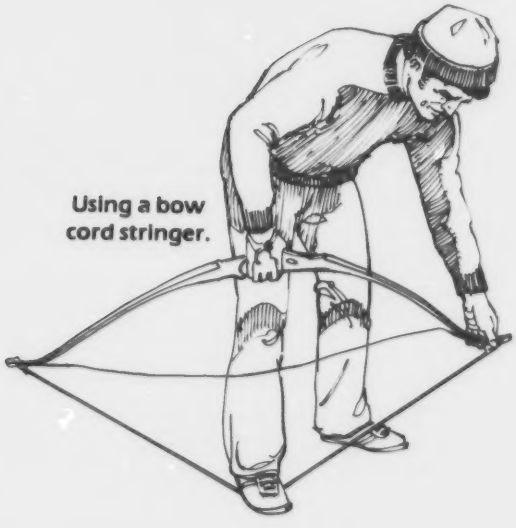
Stringing must be done with care. If braced incorrectly, the bow limbs may snap back and hit you. The best method of stringing a bow is to use a bow stringer. The stringer is a length of heavy test nylon with a leather pouch at each end. It is inexpensive and can be carried in a pocket.

To string the bow using a bow cord stringer;

a) Slip the larger loop over the upper bow limb.
b) Place the smaller bowstring loop in the groove of the lower nock and secure with a rubber tip protector.
c) Fit the stringer pouches over the bow tips.
d) Stand on the center of the bowstringer, pulling the bow up while holding it by the handle.
e) When the bow has sufficient flex, slip the upper string loop in the grooved nock.

Another way to string a bow is called the "step-through" method:

a) Place the bottom bowstring loop in the groove of the lower nock and secure with a rubber tip protector.
b) With the right leg, step through or between the string and bow and hook the lower recurve on the outside of the left foot and over the instep.
c) Place thigh against the bow handle and apply pressure backward. At the same time, bend the bow by leaning forward from the waist and applying pressure with the right hand. The string loop can then be slipped into place in the upper nock. Before pressure is released, check to make sure the string loops are firmly seated in the bow nocks. After you string your bow, check the brace height. This is the distance between the face of the bow at the handle and the string. Most manufacturers specify the proper brace height for each bow. Buying a bowstring specified for your particular bow is made easier by taking your old bowstring with you when purchasing a new one.

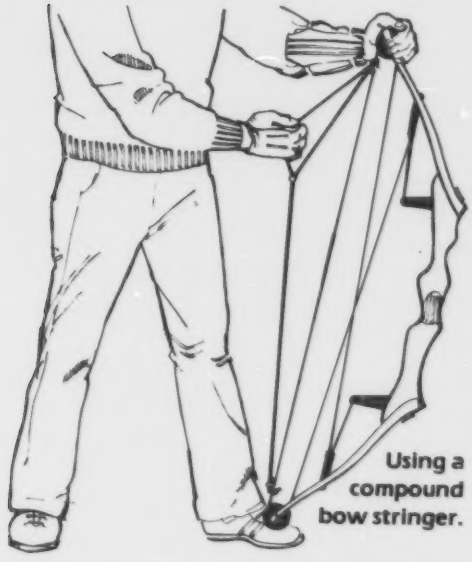


Using a bow cord stringer.

Using belt or rope to avoid twist in limbs.

If your bowstring is slightly long, you can twist the bowstring until you obtain the proper brace height.

Compound bows must be strung by using a compound bow stringer. Compound bows are not unstrung after use, as are other types of bows, so you will need to use the bow stringer only when a worn string must be replaced. Follow the instructions provided with the compound stringer carefully.

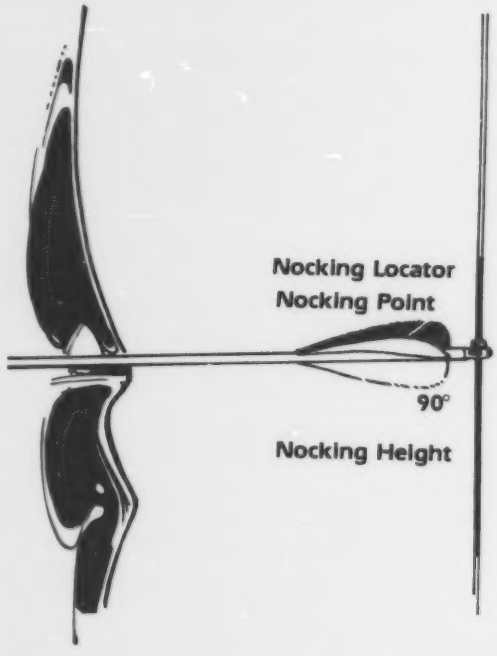


Using a compound bow stringer.

Marking the Nocking Point

You must have a specified point on your bowstring to place the arrow for every shot. The point where the arrow rests on the bowstring is called the nocking point. Every time you place an arrow on the string, or nock it, you should use the same nocking point.

To find the nocking point, place an arrow on the bow with the shaft lying on the arrow rest on the handle and the nock fitted onto the bow string.



Adjust the arrow so it makes a 90 degree angle with the bowstring. The nocking point is 1/8 to 3/16 of an inch (3 mm to 5 mm) higher than the place where the bowstring and arrow are at right angles. You can buy a tiny nocking bead to attach to the bowstring to mark this point. Some archers use a double nocking point, and the arrow nock is positioned in the centre of the two markers.

FUNDAMENTALS OF BOW SHOOTING

Master Eye

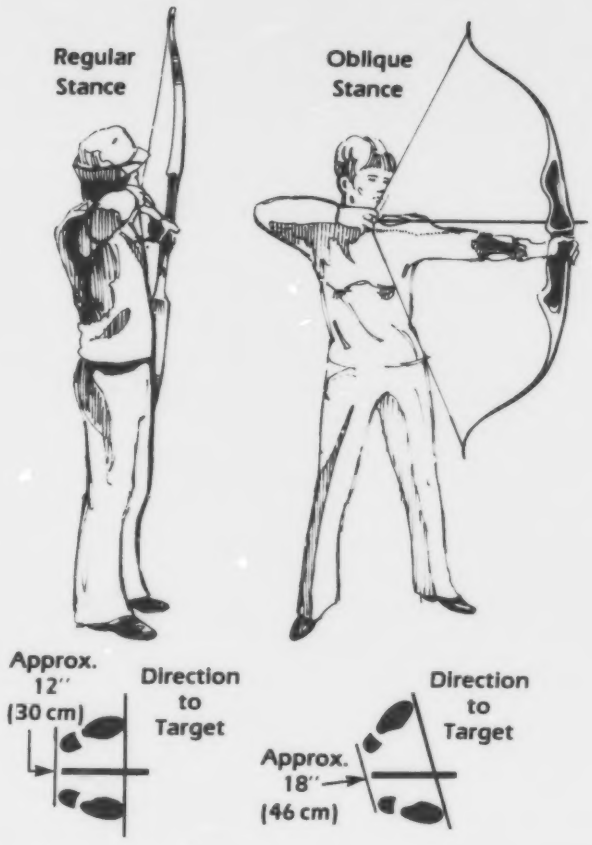
As in rifle, pistol and shotgun shooting, it is necessary for an archer to determine which of his eyes is the more important one. Although both eyes should be used when shooting the bow, the archer should shoot from the right side if his right eye is his master eye—from the left if he has a master left eye. Otherwise, he will not be shooting where he is looking.

Archery Fundamentals

To shoot a bow properly and effectively, an archer must learn the fundamentals of archery thoroughly before putting them into practice. Every beginning bow hunger should learn to shoot under the guidance of a competent coach or experienced bowman.

There are six basic steps in correct shooting techniques:

1. Stance
2. Gripping the bow
3. Nocking
4. Draw, anchor, and aim
5. Releasing
6. Follow-through



Stance

The correct stance will give your body a solid foundation from which to shoot. Stand at approximately a right angle to your target. Your weight should be evenly distributed on both feet which should be spread apart far enough to give you a steady balance and a comfortable relaxed position. Keep your body erect but not stiff. Once you have turned your head towards the target, keep very still. Any movement will affect the accuracy of the shot.

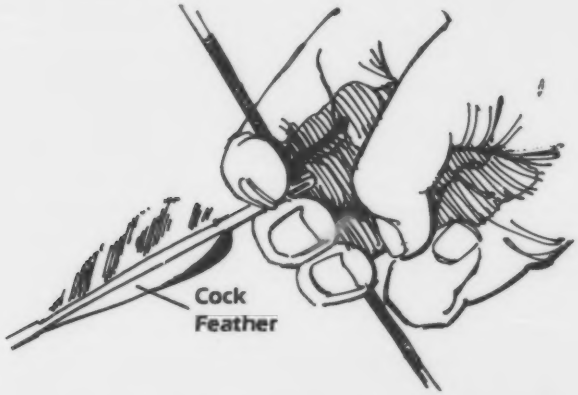
Gripping the Bow

The correct grip on the bow is essential to good shooting. Hold the bow in your left hand if you are right-handed; in your right hand if you are left-handed. The thumb

and forefinger should form a "V" at the inside of the bow handle. The bow handle should press against the base of the thumb and not against the heel of the hand. Your grip should be firm but relaxed. Do not clench the bow tightly. Keep your wrist straight, but not rigid. If your wrist bends inward it will be stung by the bowstring when it is released; if it bends outward, your grip will be weak and awkward and the bow may waver. In either case, your aim will be poor and you are likely to miss your target.

Nocking

Grip the bow properly with your gripping hand. Hold the bow parallel to the ground, about waist high, with the bowstring toward your body. Reach for an arrow with the other hand. Using your thumb and forefinger, grasp the arrow by the nock. Place the shaft across the arrow rest with the cock feather facing up, that is, at right angles to the bowstring. Slide the arrow nock towards you so the bowstring enters the slot. Then slide the nock on the string until it is positioned just underneath the nocking point.



When the arrow is nocked, hook the first three fingers of your right hand (left if you are left-handed) around the bowstring. Your forefinger goes above the nock, and your other two fingers go under the nock. The string should lie in the creases of your fingers' knuckle joints.

Draw, Anchor and Aim

After you have nocked the arrow and while the bow is still in horizontal position, extend the arm which holds the bow toward the target. With your outstretched arm parallel to the ground, turn the bow to the upright position. Keep your bow-hand and forearm level with your shoulder but bend your elbow slightly to allow for clearance of the bowstring.

Hold the bow lightly, just tightly enough to prevent it from jumping away when the string is released. The pressure as you draw will hold the bow firmly against the fleshy part of your palm at the base of the thumb. With the three fingers of your draw hand, draw the string steadily back until your drawing fingers touch a spot on your face or chin. This spot is called the anchor point. When your drawing hand touches your anchor point you are at full draw.

The location of your personal anchor point is not particularly important. But it is very important that your draw is anchored at exactly the same point on your face or chin each time you draw. If it varies, your shooting will not be consistent.

Drawing a bow is a dual action. You pull back on the bowstring, and at the same time you press the bow itself forward. Be sure to use your back and shoulder muscles to do the pulling and not the arm or hand. As you draw the bowstring steadily back, breathe in deeply. Drawing, from the time you begin to pull the string to your face until the arrow is released, should always be one smooth, continuous action.

When your drawing hand reaches the anchor position, hold it tightly against your anchor point for a few seconds to steady your aim. While holding the full draw, tighten your back muscles. If you attempt to keep the bow at full draw without increasing the pressure, your back and shoulder muscles will quickly tire and the arrow will creep forward. Even a little lessening of full draw will make your shot less powerful and not as accurate.

There are many aiming techniques but two very reliable methods are to use a bow sight or to shoot using the *point-of-aim* technique.

For consistent accuracy in shooting, a *bow sight* has several advantages. Use of a bow sight is the surest of all methods of aiming. It is the quickest way for a novice to become expert at hitting the target.

The sighting mechanism of most basic sights is usually a moveable pin, bead or post. More sophisticated models and telescopic sights use cross hair optical devices as the sighting instrument. The sight mechanism can be moved up and down or sideways to correspond with various distances marked on the panel of the bow sight.

To set the bow sight, line up the head of the pin or other device with the target. Then shoot. If the arrow hits low, adjust the sight by moving the pin down. If the arrow hits high, move the sight up. To adjust the shot to the left or right, move the sight pin sideways. When the arrow is left of the centre, move the sight pin left. When the arrow is right of centre, move the sight pin right. Continue this trial-and-error adjustment until the arrows hit the target exactly.

When the sight is properly set for a given distance, the archer lines up the pin or other sighting device with the target and shoots, usually with remarkable accuracy.

Using the *point-of-aim* technique, the archer focuses on the point of the arrow instead of the target and lines up the arrow's tip with some point either above or below the actual target.

The point of aim can be almost anything—a rock, a post, a tree in the distance or specific spot of ground. On long shots, the arrow tip should be focused on some point above the true target. When distances are short, focus below the target.
By trial and error and experience, the archer will learn where the point of aim should be for various distances.

Release

A crisp, straight, even release is very important to accuracy. The release must be smooth and consistent. If it varies each time you shoot, so will the accuracy of your shot.

Hold the full draw just long enough to be sure your aim is correct. Then, simply relax the three fingers holding the bowstring, letting the string slip away smoothly. Don't jerk your fingers off the string. This will cause the shot to veer off its mark. There should be no movement except for the easy relaxing of the draw fingers.

Follow-Through

The follow-through in archery means holding your shooting position until the arrow hits the target. If you don't follow-through, keeping the bow-arm and hand perfectly still and remaining in the same position as at full draw, your shot will not be accurate and on target.

Consistent accuracy and safe shooting depends on doing the same thing the same way every time you shoot. If you practice the fundamental techniques of archery regularly, safe and accurate shooting will soon become a habit.

The practiced archer and bow hunter doesn't need time to think about how to shoot. He concentrates on the target and thinks "Is it a safe shot? Is it legal? game? Should I take it?"

Common Errors

When you have learned the fundamentals of archery from a book or in the classroom, you should practice on the target range. At first, the shot will probably be erratic but you should not be discouraged. With practice and concentration, the arrows will soon begin to group on the target.

If your arrows are not hitting the bull's-eye, the following may explain why you are missing the target.

a) *High* - Overdrawing the bow; pulling bowstring back beyond anchor point; nocking point may be too low.

b) *Low* - Insufficient draw; not pulling back to anchor point; string hand may be creeping forward at the instant of release.

c) *Right* - Arrows of insufficient spine for bow weight; having fingers bent too far around bowstring; improper stance.

d) *Left* - Arrows have too much spine; gripping the bow handle too tightly; moving string hand away from anchor point.

e) *High and Right* - Jerking the drawing hand back and inward as arrow is released; too much of the fingers around bowstring.

f) *Low and Left* - Dropping bow arm as arrow is released.

THE CROSSBOW

Evidence from archaelogical studies places the origin of the crossbow in China about two thousand years before Christ.

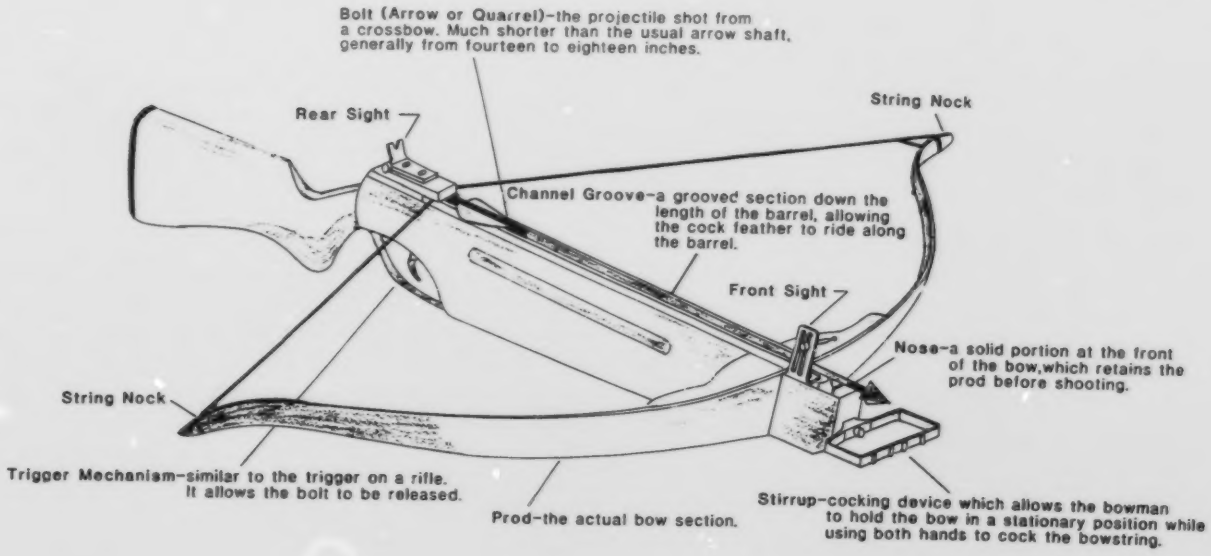
Historic evidence of crossbows suggests that military explorations brought the weapon westwards into the near East and Europe. By the 11th century, it was a common arm for defensive forces.

Crossbows persist today as useful hunting weapons in a number of primitive hunting/gathering communities in Africa, South America, and Malaysia. In the western world, it is an instrument of competitive target shooting whose use as implement for hunting is increasing with the recent surge of interest in archery.

The implement is a very strong bow (prod) mounted upon a wooden or metal "arm", similar to the stock of a rifle, (a substitute for the archer's arm) whose string is drawn by hand, or by a mechanical device, to place the bowstring into the lock, ready for release by one of a variety of trigger systems not too dissimilar from those found on firearms.

This mechanical system allows the mounting of a bow whose draw weight can be much greater than that which can be arm drawn on a simple or compound longbow. It also enables the crossbow to use arrows of a much greater range of weight than found in conventional arrows; the heavier the prod the heavier the bolt.

Crossbow arrows, whether used in competitive shooting or hunting, are generally in the 14-18 inch (35 - 45 cm) range. Construction of the bolt or quarrel is similar to that of other archery arrows, except that the forked nock is not usually present. Rather, a straight butt or one with a slight concavity for string landing is provided.


Bolt (Arrow or Quarrel)–the projectile shot from a crossbow. Much shorter than the usual arrow shaft, generally from fourteen to eighteen inches.
Rear Sight
String Nock
Channel Groove–a grooved section down the length of the barrel, allowing the cock feather to ride along the barrel.
Front Sight
Nose–a solid portion at the front of the bow,which retains the prod before shooting.
String Nock
Trigger Mechanism–similar to the trigger on a rifle. It allows the bolt to be released.
Prod–the actual bow section.
Stirrup–cocking device which allows the bowman to hold the bow in a stationary position while using both hands to cock the bowstring.

Hunting with a Crossbow

The ballistic capability of the modern crossbow is almost identical to that of a hunting longbow and limits its use for any responsible hunting to distances about 40 metres. The weapon is not a convenient device for a hunter on the move while stalking game. The shape of the crossbow does not allow for silently moving through trees and brush, and the retention of the arrow in a "loaded" position is almost impossible. While the longbow hunter places his arrow and draws the string only after sighting the quarry, the crossbowman must place the bolt against the string in the groove of an already cocked bow. This action requires that the hunter stay in a fixed location. Thus, crossbow hunting is effective only from a point of concealment — often from a dominant elevation over-looking a game trail or crossing. Such conditions impose severe restrictions on the crossbow hunter in his hunting strategy, and require a high degree of shooting competence. He must have a thorough knowledge of the flight curve of his arrows, be able to accurately estimate distance, and be aware of the vital areas of the animals he seeks.

Safety

Safety considerations of the use of crossbows require special care, for, while the longbow shooter manually draws and holds his bowstring and may release or relax it under the same control, the crossbow, once cocked, must, for safety of the hunter and for protection the bow and string, be loosed under load. Movement on the ground with a cocked crossbow loaded with a broadhead is hazardous ,as the arrow is held largely by gravity alone in the groove of the bowstock — another reason for the stationary hunting position of the crossbowman.

Arrows (Bolts or Quarrels)

A crossbow arrow is similar in form to the longbow arrow, but, being much shorter than a standard arrow, it must be much more heavily constructed than the standard hunting arrow to perform similarly. Both, in general hunting situations, achieve about the same velocities, but in order to retain the power of penetration at optimum target distances the crossbow bolt usually must weight at least as much or more than the longbow arrow. Increasing the draw weight of the prod will not produce significantly greater velocity, but it will enable the use of a proportionately heavier arrow.

Sights

Sights of different forms are adaptable to the crossbow, the most common of which are a rear aperture with laddered forward post sight, similar to the sight on a longbow. Telescopic sights are debatably of benefit to the crossbow hunter because of the varying performance of the bolt at distance. Also, the trajectory of the arrows is so extreme that a mechanism to adjust the entire scope sight must be incorporated in the sighting attachment.

Both the longbow (including the modern compound format — which is now available in manufactured crossbows) and the crossbow present good opportunities for close-quarter hunting. The expertise of the hunter is more exacting for any bowhunter than that commonly found in firearm hunters. Only by constant practice with the instrument, through knowledge of the hunting locations, light, and weather conditions, experience with arrow performance, and a familiarity with the anatomy and behaviour of the quarry can a bow hunter become competent. And only by such demonstrated competence can the bow hunter gain the confidence necessary to make proper killing shots on game.

ARCHERY HUNTING REGULATIONS

Bows and arrows and crossbows and bolts (quarrels) may be used for hunting all big game, small game and game birds except a crossbow is prohibited to hunt migratory game birds. The following restrictions apply to the use of bows and crossbows province-wide. Check regional schedules for open seasons and additional restrictions.

Crossbows

(1) No person shall hunt big game, other than deer, with a crossbow (does not include compound crossbows) having a pull of less than 68 kg (150 lbs.) or a bolt (quarrel) weighing less than 16.2 grams (250 grains).

(2) No person shall hunt deer, small game, or game birds with a crossbow (does not include compound crossbows) having a pull of less than 55 kg (120 lbs.) or a bolt (quarrel) weighing less than 16.2 grams (250 grains).

(3) No person shall hunt wildlife with a compound crossbow having a pull of less than 45 kg (100 lbs.) at peak weight or a bolt weighing less than 16.2 grams (250 grains).

(4) No person shall hunt game with a crossbow having a bolt (quarrel) other than one having a broadhead of at least 2.22 centimetres (7/8 of an inch) at the widest point.

Long Bow and Arrow

No person shall hunt big game with a long bow having a pull of less than 18 kg (40 lbs.) within the archer's draw length and an arrow other than one having a broadhead at least 2.22 centimeters (7/8 of an inch) at the widest point.

No person shall hunt small game with a long bow having a pull of less than 18 kg (40 lbs.) within the archer's draw length.

BOW HUNTING

Just as bow hunting requires special equipment, the bow hunter must have special knowledge—a thorough knowledge of bow hunting equipment, its use and its limitations; knowledge of the game to be hunted, its habits and habitat; knowledge of the challenge; and knowledge of self.

The prospective bow hunter should learn by reading as much as possible about the sport and learn the special techniques required under the guidance of an experienced bow hunter.

A bow hunter should keep these following thoughts in mind:

1. He must get close to his quarry to be able to aim with a reasonable chance for success. He must therefore become familiar with the species of game to be hunted; know when and where these animals travel; where they feed and what they eat; and learn their particular habits.

2. He must accept the limitations of his equipment. An arrow, if well placed and shot from a reasonable distance, will kill an animal quickly, but the shot must be accurate and hit a vital spot. The bow hunter must master the skills of the marksman before attempting to take game in the field. The first shot is most often the only shot the hunter will have.

3. He must know the vital areas of the game species being hunted. As well as being accurate, the bow hunter must know where to aim in order to kill the animal quickly and cleanly. The bow hunter must know where the animal's arteries, heart, lungs, spine, shoulders and pelvis are located. These locations differ in various species of game.

4. When game has been wounded, it must not be lost. The hunter should know the

kind of wound and the extent of the injury, based on colour, thickness, and amount of blood trail. He must pursue the wounded animal until it is found, or until he is sure the wound is slight and the animal will recover.

5. The bow hunter must be committed to the sport. If he needs to know game—he learns about it; if he must shoot well—he practices until he can; if the requirements for success are high—he must choose to meet them and succeed.

To the sportsman bow hunter who examines these points and accepts the challenge, the rewards are many and the satisfaction complete.

GLOSSARY OF FIREARMS TERMINOLOGY

Action: The mechanism of a firearm directly behind the barrel, by which a gun is loaded, locked, fired, unlocked, extracted and ejected.

Anvil: That part of the cartridge primer which is a solid surface, against which the firing pin strikes to set off the priming powder.

Autoloading: See *Semi-AutoMatic*

Ball: The round lead missile fired by smoothbore firearms. (The term is used today when referring to some types of bullets fired from rifled barrels).

Ballistic Coefficient: A number which indicates how a bullet's shape, length, weight, diameter and nose design affect its stability, velocity and range against air resistance.

Ballistics: The study of what happens to moving projectiles in the barrel and in flight - their trajectory, force, impact and penetration. "Internal ballistics" refers to what happens inside the barrel before the bullet or shot leaves the muzzle; "external ballistics" is what happens after the bullet or shot leaves the barrel and travels to its final point of impact and "terminal ballistics" is what happens to the bullet at the final point of impact.

Barrel: The metal tube of a firearm made from iron or steel, through which the bullet or shot charge passes when the firearm is fired.

Base Wad: The paper filler at the rear of the powder charge of the shotgun shell.

Battery: The metal arm of a flintlock mechanism, against which flint strikes to create sparks in the flashpan (also called the "frizzen").

Beavertail: A wide, flat fore-end of a rifle or shotgun.

Bedding: That part of the stock into which the barrel fits.

Belt: The narrow band around the rear section of a cartridge case just forward of the extractor groove. (The belt arrests the progress of the case into the chamber and controls headspace.)

Berdan Primer: See *Primer*

Black Powder: A finely ground mixture of three basic ingredients - saltpetre (potassium nitrate), charcoal (carbon) and sulphur.

Blown Pattern: A shotgun pattern with erratic shot distribution, generally caused by gas escaping past the wads and getting into the shot.

Bluing: A process of treating metal gun parts in a bath of metallic salts and water, which colors them blue to prevent rust.

Boattail: The tapered rear end of a bullet. (Also called "taper heel", this design is used to increase ballistic efficiency at long range.)

Bolt: A steel rod-like assembly which moves back and forth in a bolt action, sealing the cartridge in the chamber during firing.

Bolt Face: The forward end of the bolt which supports the base of the cartridge and contains the firing pin.

Bore: The tunnel down the barrel of a firearm through which the projectiles travel.

Bore Diameter: The measurement from one side of the bore to the other. In a rifled barrel this means measurement of the bore before the rifling grooves are cut.

Breech: The rear end of the barrel (in modern

arms, the portion of the barrel into which the cartridge is inserted. See *Chamber.*

Breechblock: The part in the breech mechanism that locks the action against the firing of the cartridge.

Breechloader: A firearm loaded through the breech.

Buckshot: Large lead pellets used in shotshells.

Bullet: A single projectile fired from a firearm.

Butt: The rear end of a rifle or shotgun. (The portion that rests against the shoulder.)

Buttplate: A plate which covers the butt. (Some steel buttplates have trap doors covering a recess for storage of cleaning equipment.)

Calibre: The diameter of the bore of a rifle before the rifling grooves are cut.

Cannelure: A groove around the circumference of a bullet or case. (For example, the lubrication grooves of lead bullets, or the grooves into which the mouth of the cartridge case is crimped, or the extractor grooves of the rimless or belted case.)

Cant: To tilt or lean a gun to the side when aiming.

Cap: See *Percussion Cap.*

Carbine: A light short-barreled riffle.

Cartridge: A case, usually made of brass or copper, containing the powder charge, the primer and the bullet. (Before development of the metallic cartridge, the term was used to mean a roll or case of paper containing powder and shot. Modern cartridges are generally classified in three categories — "centrefire metallics", rimfires" and "shotshells". Centrefire metallics include all metal cartridges that have primers in the center of the base. Rimfires include all cartridges in which the priming powder is sealed in the soft rim around the base. Shotshells include all cartridges that contain shot, or small pellets, instead of a single bullet.)

Centre-Fire: See *Cartridge.*

Chamber: The enlarged portion of the barrel at the breech in which the cartridge is placed ready for firing.

Checkering: A diamond-like patter on fore-ends and grips of firearms. (The diamonds are made by cutting crossing lines into the material with special tools.)

Choke: The constriction at the muzzle of a shotgun barrel by which the spread of the shot pattern is controlled.

Cup: A detachable metal case designed to hold a number of cartridges for loading into the firearm.

Cock: To set the action into position for firing. (On some firearms the action has an intermediate position called half cock. On early weapons such as the flintlock and percussion cap, the hammer was called a cock.)

Comb: The upper edge of a rifle or shotgun stock where the cheek rests.

Cone: The sloping portion at the front end of a shotgun chamber in which the chamber diameter is decreased to the diameter of the muzzle. Also, the rear portion of the choke at the muzzle of a shotgun.

Conical Bullet A cone-shaped bullet.

Cordite: A double-base smokeless powder made of nitroglycerine and guncotton which is used in the form of long, stringy cords.

Core: The part of a bullet that is covered by a jacket.

Corrosion: The gradual eating away of the metal parts of a firearm caused by rust.

Creep: The movement of the trigger before it releases. (Also called drag or crawl.)

Crimp: The portion of a cartridge case that is bent inward to hold the bullet in place, or in the case of shotshell, to hold the shot charge in place.

Cross Hairs: The sighting lines in a telescopic sight.

Damascus Barrels: Barrels made of strips of iron and steel welded together in a spiral fashion. (Modern ammunition should not be used in such firearms.)

Deterrent: A material added to an explosive to slow its burning rate.

Double-Base Powder: A rapidly burning powder made by absorbing nitroglycerine into nitrocellulose (guncotton). (Cordite is a double-base powder.)

Doughnut Pattern: A shotgun pattern with a hole in the middle generally caused by the interference of the top wad.

Down Range: The direction from the shooting position to the target on a range. See *Range*.

Drift: The departure of a bullet or shot charge from the normal line of flight. (This can be caused by wind or the unbalanced spinning of the bullet.)

Drilling: A three-barrel gun with a rifle barrel beneath two shotgun barrels. (Generally of German manufacture.)

Ejector: The mechanism which throws the cartridge case free from the gun.

Elevation: The degree of adjustment of a rear sight or scope reticule necessary to cause the bullet to strike higher on the target.

Energy: The amount of work done by a bullet, expressed in foot pounds.

Erosion: The wearing away of a barrel's metal surface by a bullet or shot charge or by the heat of powder gases.

Extractor: A hook device which pulls the case out of a chamber as the breech mechanism is opened. (The extractor generally brings the case within reach of the ejector, which then flips it out of the gun.)

Feed: The action of moving live cartridges from the magazine of a firearm into the chamber.

Firing Pin: The part of the breech mechanism which strikes the primer of the cartridge. (In most firearms, the firing pin is part of the bolt assembly.)

Flinch: To move or jerk a firearm involuntarily while shooting.

Flint: A piece of stone held in the cock of a firearm. (When it strikes the steel battery, or "frizzen", this causes a shower of sparks to fall into the flashpan and ignite the powder.)

Flintlock: The gunlock of early firearms in which flint is thrown against steel, causing sparks to ignite the powder charge.

Floor Plate: The detachable metal plat at the bottom of the cartridge magazine of a bolt action rifle. (The floor plate is usually hinged at the front and held by a release spring located just ahead of the trigger guard.)

Fore-End: The forward portion of a shoulder-arm stock. (Located under the barrel, the fore-end serves as a hand-hold.)

f.p.s.: Abbreviation for feet per second. A term used in expressing the velocity of a bullet.

Frizzen: See *Battery.*

Fulminate Of Mercury: A highly sensitive explosive used as a primer compound.

Gain Twist: Barrel rifling which increases in pitch from the breech to the muzzle to accelerate the spin of a bullet.

Gas Check: A metal cup placed on the end of a lead bullet to protect the lead against the hot gases of the burning powder charge.

Gas Port: A small hole in the barrel of a gas-operated firearm through which expanding gases escape to power the autoloading system.

Gauge: Measurement of shotgun bores derived from the number of bore-sized balls of lead to the pound. For example, 12 balls which fit the bore of a 12-gauge shotgun weigh one pound.

Grip: The small portion of the stock gripped by the trigger hand.

Grip Cap: A cap fastened over the end of a pistol grip on a rifle or shotgun stock.

Grooves: See *Rifling.*

Group: A series of shots fired with the same sight setting and the same aim.

Half Cock: See *Cock.*

Hammer: The part of the action that drives the firing pin forward.

Hammerless: Refers to a firearm whose hammer and striker are concealed within the metal frame.

Hand Cannon: On a variety of small, crude cannons used in the early 15th century.

Hangfire: Delay in firing a cartridge after the firing pin has struck the primer.

Headspace: The distance between the base of the cartridge and the face of the bolt or breechlock. (This is determined by the rim of rimmed cartridges, the belt of belted cartridges and the shoulder or rimless cartridges).

Heel: The rear end of the upper edge of a gunstock. Also the base of a bullet.

High Intensity: Refers to cartridges having velocities of 2,700 per second (822.96 metres per second) or more.

High Power: A term applied to the first smokeless powder cartridges with velocities of approximately 2,000 feet per second (609.6 metres per second).

Holding: The action of keeping the sights on the target while applying pressure to the trigger.

Hollow Point: A bullet with a nose cavity designed to increase its expansion on impact.

Igniting Charge: The charge used to ignite the propelling charge. (See *Primer*).

Inertia Firing Pin: A firing pin which moves freely forward and backward in the breechblock. (The striker impels it forward while the explosion of the primer impels it backward).

International Ballistics: See *Ballistics.*

Iron Pyrites: See *Pyrites, Flint.*

Jacket: The outer covering over the inner metal core of a bullet.

Jaws: The vise-like device on a flintlock hammer used to hold the flint.

Jump: The amount of change in the bore axis, measured both vertically and horizontally, while the projectile moves from the chamber to the muzzle when it is fired.

Kentucky Rifle: A flintlock rifle with a long barrel and short, crooked stock.

Keyholing: The failure of a bullet to remain balanced in flight so that it enters the target sideways, leaving an elongated opening.

Kick: The backward movement of a firearm generated by the discharge of the projectile. See *Recoil.*

Knurled Surface: A metal surface which contains a pattern of ridges or beads. (This rough surface aids grasping a metal part to move it.)

Lands: In the rifling of a bore, the uncut portions of the barrel's inner surface left after the rifling grooves have been cut into the metal. See *Rifling.*

Leading: Fouling of a firearm bore by metal particles from bullets adhering to the metal surface caused by heat or friction.

Lede: The bevelled portion of the rifling at the rear end of the barrel (and the forward portion of the chamber) where the bullet first engages the lands.

Length Of Pull: The distance from the front trigger of a shotgun to the centre of the butt.

Lever Action: An action operated by a lever located underneath it. (A secondary purpose of the lever is to serve as a trigger guard.)

Line Of Bore: An imaginary straight line through the centre of the bore of a firearm extending to infinity.

Line Of Sight: An imaginary straight line from the eye through the sights of a firearm to the target.

Load: A charge of powder, a projectile or a cartridge. Also, to prepare a gun for firing by inserting ammunition into it.

Loading Gate: The hinged cover over the opening through which cartridges are inserted into the magazine.

Lock: The firing mechanism of a a muzzle-loading weapon. In breech-loading firearms, the lock is the firing mechanism and breech-sealing assembly.

Locking Lugs: A series of projections on the bolt of a firearm designed to fit into corresponding slots in the receiver to lock the action in closed position for firing.

Lockplate: A metal plate on which the firing mechanism is mounted on percussion and earlier firearms.

Lock Time: The interval of time between trigger release and the detonation of the primer. (Also called lock speed.)

L.R.: Abbreviation for long rifle.

Machine Gun: A firearm which continuously fires ammunition at a high rate of fire when the trigger is pulled only once. See *Automatic.*

Magazine: The part of a repeating firearm which holds the cartridges or shells in position ready to be loaded one at a time into the chamber. (The magazine may be an integral part of a firearm or a separate device attached to the action.)

Magnum: A cartridge or shell with greater power than normal (i.e. .300 magnum rifle, 3 inch magnum shotshell).

Mainspring: A strong spring which activates the striker or hammer of a firearm.

Match: A long cord of hemp, flax or cotton, saturated in saltpetre, which burs slowly without a flame. (It was used to ignite powder in early firearms.)

Matchlock: A firearm action which relies upon a serpentine or S-shaped piece of metal to hold a smoldering match. By pressing the lower end of the serpentine, the upper end holding the burning match contacts the priming powder in the pan.

Metal Cased: A bullet with a lead core and a solid metal jacket.

Metallic Cartridge: A cartridge with a metallic case. (Early cartridge cases were made of linen, paper, etc.)

Metallic Sight: A non-telescopic firearm sight.

Mid-Range: The point in the trajectory halfway between the muzzle and the target.

Millimetre: A metric measurement equalling .03907 inches. (Its abbreviation is mm.)

Mini-Ball: An elongated lead bullet with a pointed head and a cup-shaped hollow in its base which spreads as it is fired, forcing the metal into the rifle grooves.

Misfire: Failure of a cartridge to discharge after the firearm's firing pin has struck the primer. See *Hangfire.*

Mouth: The open end of a cartridge case into which the bullet is inserted.

Mushroom: The shape many bullets assume when the tip expands upon striking. (Sometimes called mushroom bullets.)

Musket: A smoothbore shoulder gun (commonly used by military in the 17th, 18th and 19th centuries.)

Musketoon: A musket shortened for cavalry use.

Muzzle: The forward end of a barrel.

Muzzle Blast: The violent disturbance in the atmosphere after discharge of a firearm, caused by release of powder gases into the air.

Muzzle Brake: A slotted device attached to the muzzle which softens the kick of the firearm.

Muzzle Energy: The energy of a bullet as it emerges from the muzzle. (Usually expressed in foot pounds.)

Muzzle Flash: The bright flash at the muzzle of a firearm resulting from burning of gases.

Muzzeloader: A firearm that is loaded through the muzzle.

Muzzle Velocity: See *Velocity.*

Naked Bullet: A bullet not covered by a metal jacket or patch.

Neck: The forward portion of a bottlenecked cartridge case. Also the portion of a rifle chamber in which the neck of the cartridge case rests.

Needle Gun: The first rifle known to use a bolt action.

Nipple: A small metal tube extending through the breech of a percussion firearm through which the flame passes from the percussion cap to fire the powder charge.

Nose: The point of a projectile.

Obturation: The expansion of the cartridge case which seals the chamber preventing gases from escaping.

Open Sight: A non-telescopic firearm sight. See *Sight.*

Optical Sight: Usually a telescopic firearm sight. See *Sight.*

Over-And-Under Gun: A firearm with two or more barrels placed one over the other.

Pan: The small dished container located on the side or top of a matchlock, wheel-lock or flintlock forearm used to hold the priming powder charge.

Parallax: The displacement of an object viewed from two different position. (For example, when using a telescopic sight, the apparent movement of the reticule in relation to the target when the eye is shifted to a different position.)

Parkerizing: A non-reflecting, rust-preventive finish used on the metal of firearms.

Patch: A piece of leather or cloth. The patch is greased and placed around a bullet before ramming it down the barrel of a muzzleloader.

Patch Box: Covered compartment in the buttstock of a muzzle-loading rifle used to carry patches or other small items.

Pattern: Distribution of shotgun pellets. This is measured at a standard distance of 40 yards (37 m) using a 30 inch circle (762 mm). (A full choke charge should throw a patter of at least 70 percent of the shot in the 30 inch circle at a distance of 40 yards.)

Penetration: The distance travelled by a projectile from the point where it strikes the target to the point where it stops.

Pennsylvania Rifle: See *Kentucky Rifle.*

Percussion Cap: A small metal explosive-filled cup which is placed over the nipple of a percussion firearm. (As the cap is struck by the hammer, it explodes and sends a flame through the flashhole in the nipple to the main powder charge.)

Pistol Grip: See *Grip.*

Pitch: The angle of the barrel of a rifle or shotgun away from the angle of the stock. (It is measured by placing the butt of the stock on the floor and measuring the angle of the muzzle away from a line perpendicular to the floor.)

Powder: The general term for any propellant used in firearms which burns upon ignition. (The two major types are black powder, which is a physical mixture of charcoal, sulphur and saltpetre, and smokeless powder, base of the bullet, chamber and bolt face of the rifle.)

Prime: To prepare or charge a muzzle loader for firing.

Primer: The collective term for the chemical primer compound, cup and anvil which, when struck, ignites the powder charge.

Primer Cup: The housing in a shotgun cartridge base which holds a primer.

Primer Pocket: The depression in the base of a centrefire cartridge which contains the primer.

Priming Pan: See *Pan.*

Projectile: A bullet or shot in flight after discharge from a firearm.

Propellant: The chemical substance which imparts movement to the projectile in a firearm.

Pumpkin Ball: A large round ball of lead used in shotguns. (These projectiles are the same size as the shotgun bore.)

Pyrites: A mineral used to produce sparks in primitive firearms. (It was replaced by flint.)

Ramrod: A wood or metal rod used to force the wad and bullet down the barrel of a muzzle-loading firearm.

Range: The distance travelled by a projectile from the firearm to the target. "Pointblank range" is the distance a projectile will travel before it drops the extent that sight adjustment is required. "Effective range" is the greatest distance a projectile will travel with accuracy. "Extreme range" is the maximum distance a projectile will travel. Also, a facility designed for the safe shooting of firearms.

Receiver: The metal frame of a rifle or shotgun which contains the breech, locking mechanism and reloading mechanism.

Receiver Ring: The portion of the receiver which is threaded so the barrel can be attached to it.

Receiver Sight: A sight attached to the receiver.

Recoil: The backward force of a firearm caused by expansion of powder gases which also impels the bullet out of the barrel. Recoil is measured in foot pounds. See *Kick*.

R.F.: Abbreviation for *Rimfire*.

Rifle: A shoulder firearm with a rifled barrel designed to fire one projectile at a time. See *Rifling*.

Rifled Slug: A large, single projectile used in shotguns.

Rifling: Spiral grooves cut into the inside barrel surface to cause a bullet to spin, thereby stabilizing it. The cut-away portions of the rifling are called *Grooves* and the uncut portions are called *Lands*. See *Lands* and *Grooves*.

Rim: The edge on the base of a cartridge case which stops the progress of the case into the chamber. (It's also the part of the case the extractor grips to remove it from the chamber.)

Rimfire: A cartridge in which the priming compound is contained in the rim at the base of the cartridge. (See also *Cartridge*.)

Safety: A device that blocks the firing mechanism of a firearm.

Sear: The part of a firearm which links the trigger and the firing pin and releases it when the trigger is pulled.

Sectional Density: The relationship between the weight of the bullet and the cross-sectional area.

Semi-Automatic: An action which fires, extracts, ejects, reloads and cocks with each separate pull of the trigger and is powered by the propellant gases. (Also called autoloading.)

Serpentine: See *Matchlock*.

Setscrew: A screw that regulates the amount of pressure needed to release the sear.

Shotgun: A firearm with a smooth bore designed to fire small pellets called shot or rifled slugs.

Shotshell: See *Cartridge*.

Shoulder: The sharply sloping portion of the cartridge case joining the body and neck. (Found only on bottleneck shaped cartridge cases.)

Sight: The device on a firearm designed to help the shooter aim accurately.

Slack: The amount of movement in a trigger mechanism before it engages the sear.

Sling: A strap used to carry and aid in shooting a rifle.

Sling Swivel: A metal loop, sometimes detachable, by which the sling is attached to the firearm.

Small Bore: Generally refers to a .22 calibre firearm.

Small-Of-The-Stock: The narrow portion of the stock between the comb and the receiver of a shoulder firearm.

Smokeless Powder: See *Powder.*

Smooth Bore: A firearm with a bore that is not rifled.

Snap Shot: A quick shot taken without deliberate aim.

Spanner: A small metal wrench used to wind the mechanism of a wheel-lock.

Spent Bullet: A projectile which has lost nearly all its energy and lacks the force needed to penetrate the target.

Spitzer: A bullet with a sharp point for better stability during flight.

Stock: The part of a shoulder firearm by which it is held for firing and into which the metal parts are fitted.

Straight-Pull Action: A bolt action in which the bolt is pulled and pushed straight backward and forward.

Striker: The front part of a firing pin which strikes the cartridge.

Swivel: See *Sling Swivel.*

Tang: A metal strip extending rearward from a rifle or shotgun receiver to attach the action to the stock.

Throat: The forward portion of the chamber where it is tapered to meet the bore.

Toe: The bottom part of the butt of a rifle or shotgun.

Trajectory: The path a bullet travels from muzzle to impact.

Trigger: The part of a firearm mechanism which releases the firing pin.

Trigger Guard: A metal loop around the trigger designed to protect it.

Trigger Plate: The metal part under the receiver of a rifle or shotgun through which the trigger projects.

Trombone Action: A pump or slide action.

Turn-Bolt Action: A bolt action which is locked by pressing the bolt handle in and down, thereby turning its locking lugs into the receiver.

Twist: The angle of rifling grooves relative to the bore axis. (Expressed as the distance in inches over which a turn or twist is completed, i.e., 1-10, 1-22.)

Velocity: The speed at which a projectile travels. (Usually measured in feet per second or metres per second.)

Wad: A disc used to separate powder from shot; or to seal propellant gases behind the shot; or to hold shot together in the barrel.

W.C.F: Abbreviation for Winchester Centre Fire.

Wheel-Lock: An early firearm mechanism in which a wheel with serrated edges is wound against the tension of a strong spring and spins against a piece of iron pyrite, sending a shower of sparks into the pan to ignite the charge.

Wildcat Cartridge: A non-standard cartridge usually made by modifying the shape of a standard cartridge.

Windage: The lateral drift of a bullet in flight caused by wind.

W.R.F.: Abbreviation for Winchester Rim Fire.

Zero: Sight adjustment so the bullet will strike the target at the point of aim.

3

ANIMAL IDENTIFICATION

INTRODUCTION

Goal of the Chapter

The goal of this chapter is to allow the student to identify game animals of British Columbia through a knowledge of their characteristics, habitat, or distribution.

Objectives of the Chapter

This chapter will help the student to:

(1) Identify wildlife game species from descriptions or illustrations of their characteristics, habitats, or distribution.

(2) Define the following common mammal terms:

annuli
antlers
bell or dewlap
bovid
browser
brow tine, tine
carnivore, carnivorous
cervid
deer family
grazer
habitat
herbivore, herbivorous
horn
metatarsal gland
migratory
omnivorous
palmate
predator
ruminant
ungulate

(3) Discriminate between those mammals which may be legally hunted and those which cannot be hunted.

ANIMAL IDENTIFICATION

It is important for hunters to be able to accurately identify wildlife animal species. Study of their habitat will allow you to be able to know in what types of areas you will look for and find certain animals. The physical characteristics including colour and tracks will help you identify similar species. Understanding their habits will also be an aid in identification as well as tracking.

The ability to recognize various animals and their actions, and to be able to predict where they will be and how they will act, adds to the pleasure and safety of your hunting experience in several ways:

- it enables the hunter to properly identify game animals, resulting in safe, legal hunting;
- it gives the hunter a feeling of confidence and familiarity with his surroundings;
- it adds immeasurably to the interest of the hunt by suggesting a variety of features and habits that the hunter can identify and examine.

Terminology

There are a number of terms used to describe wildlife mammals. It is important to know these so you will understand the terms when you are reading about animals, and so you will be able to use the terms correctly when you are talking about the animals.

Some of the important terms include:

Annuli:

Darkened rings which indicate periods of slower horn growth; can be counted to measure animal's age.

Antlers: bony structures that grow from short pedestals on the skull of certain ungulates and are shed annually. During their development the antlers are covered with a hairy skin called velvet which has a rich supply of blood vessels and nerves. Antlers grow from the tips rather than the base (like horns). As the season progresses the antlers become ossified or boney. This ossification finally cuts off the blood vessels and nerves killing the skin and making the antler itchy. This causes the animal to rub the antlers which removes the skin and exposes the bony surface which has become shiny by the rubbing. Antlers of mature animals tend to be large and ornate in relation to the animal's body size. Antlers grow during the summer season and are fully developed by the fall. They are used by the males to assert dominance over other males during courtship rituals in the fall. By December many animals start shedding their antlers. Shedding is caused by the reabsorption of some of the basal bone which

weakens the joint so that the antler falls off if it is knocked.

Bell or Dewlap: a pendant of hair-covered skin that hangs from under the throat of an animal, e.g., the moose.

Bovids: the common term for the family of animals named *Bovidae,* which includes hoofed animals that have horns which are never shed and are not branched. Horns are present on both sexes. This group includes the wildlife species bighorn and thinhorn sheep and mountain goat, and the domestic species cattle, sheep and goats.

Browser: an animal that feeds on leaves, twigs or shoots.

Brow tine, tine: projection on an antler.

Carnivore, carnivorous: meat-eating animals.

Cervid: the common term for the family of animals named *Cervidae,* which includes hoofed mammals that have antlers. They are all ruminants. These include deer, elk, moose, and caribou.

Deer family: hoofed mammals that have antlers. They are ruminants and have no upper incisors. These include the deer, elk, moose, and caribou.

Grazer: an animal that feeds on growing grass or herbage.

Habitat: the region or environment where a plant or animal is normally found.

Herbivore, herbivorous: a plant-eating animal.

Horn: a solid, bony core which is part of the animal's skull covered by a sheath of hard fibrous horn. The horn sheath grows from the base or skin at the skull. As new growth is formed the old growth is forced away from the skull. The shape that the horn sheath takes is formed by the inner bony core, which also continues to grow. Horns are never shed but continue to grow throughout the animal's life. Both males and females have horns but may vary in shape or size by sex in some species.

Tarsal and Metatarsal gland: tufted, discoloured hair patches found between the hock and the hoof on the inside of each hind leg in deer. These areas are a source of scent used for communication.

Migratory: the act of moving from one place to another in search of food, better climate, or other environmental features.

Omnivorous: an animal that eats both meat and plant food.

Palmate: a shovel-horn type of antler characterized by broad up-reaching parallel palms, e.g., moose antler.

Predator: an animal that hunts other animals for food.

Ruminant: an animal that has a four-chambered stomach. Their method of eating is called rumination; this is a process that permits an animal to forage and ingest food rapidly, then complete the chewing at a later time. When they forage and eat they chew their food and it enters one chamber of the stomach. Later while they are resting, they regurgitate their food, chew it a second time then swallow it again.

Ungulate: hoofed animals.

TECHNIQUES OF ANIMAL AND BIRD IDENTIFICATION

Reading and studying pictures, visiting zoos and game farms, and watching television programs or films will help you learn to identify wildlife, but practice in the field is essential to develop this necessary skill. Take opportunities to go out and identify animals and tracks at different times of the year, in different habitats and different weather conditions. Practice with someone who is experienced in identifying wildlife.

When you are identifying wildlife there are many factors that you will consider. First, you must know the geographic distribution of species to know if a particular species will be in an area. The season will influence the geographic distribution of migratory animals so you must remember to take this into account.

Next, you must know what type of habitat each species will likely be found in. Habitat locations include where the species will eat, mate, sleep, keep out of the cold or wind, etc. These also change seasonally. The habits and behaviour characteristics of the species combined with habitat will give you clues on identification.

Other animal signs will also assist in identification. Tracks can be an important factor in identification. Droppings, the type of browsed vegetation, hair on bark or twigs, and other physical signs of animals can also help.

Animal sounds, gait or type of movement, and whether an animal is alone or in a group, are other factors that you should use to help you identify or confirm your identification of a species.

You must be able to identify the sex and age of game animals to ensure that you do not target an animal that you can't legally hunt.

There is some equipment that you can use to help you identify wildlife. Binoculars are extremely useful, especially at long range. They will help you see such details as colours and patterns of different species' antlers or horns. In fact, today's hunting regulations may require you to identify not only animal species and sex, but horn size to within inches and antlers to number and size of spikes or tines. Never use a telescopic sight on a rifle as a substitute for binoculars. Never point a firearm at anything you do not intend to shoot.

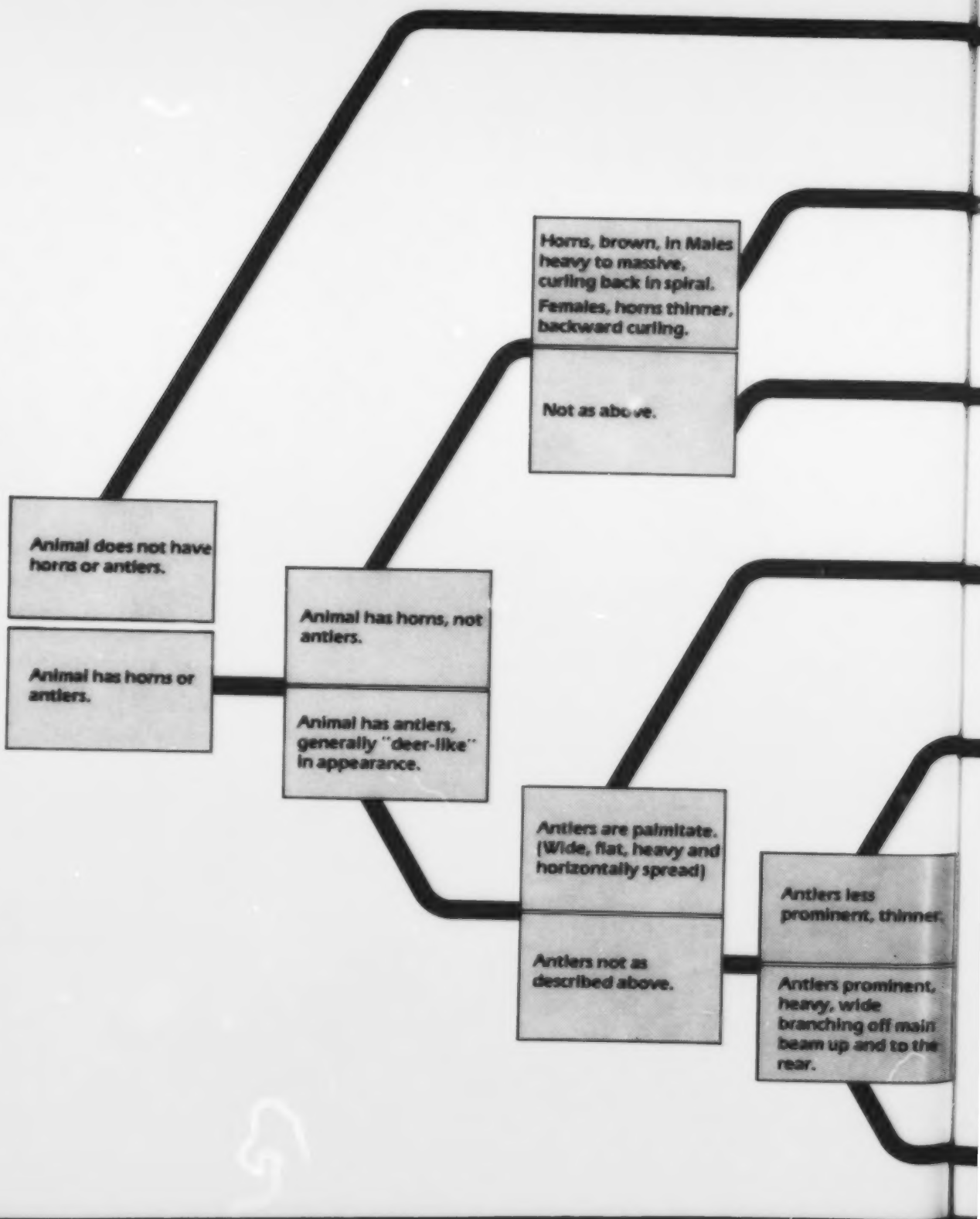
A distribution map of wildlife is useful to show you where you can expect to find certain species, and where you will not find others. Consult a map and discuss hunting areas with others.

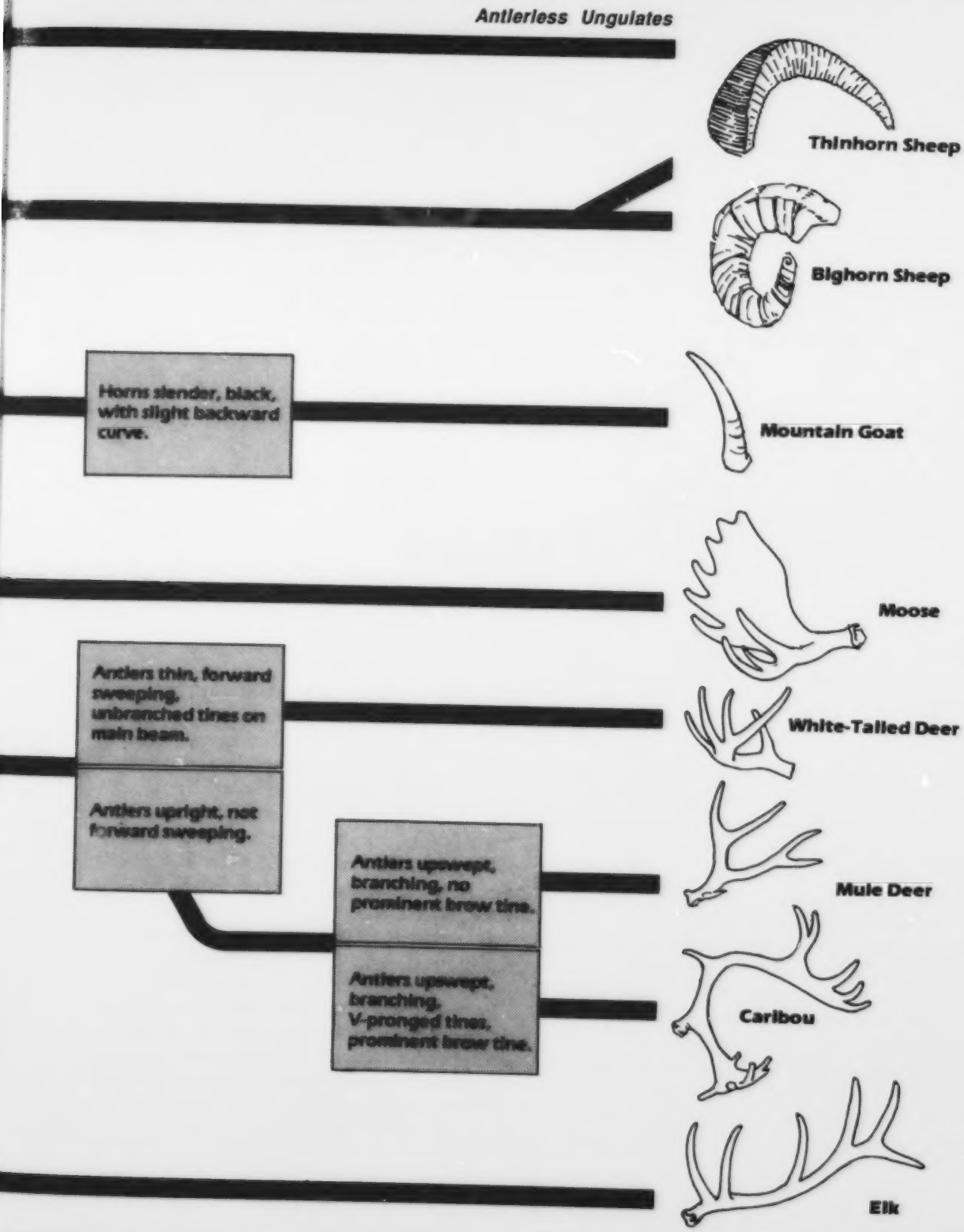
Wildlife handbooks, especially ones with colour pictures, can be a very useful item to take hunting. You can refer to it when you are uncertain or want to confirm your identification, improving your skill.

Animal Droppings (During Hunting Season)

Shown Actual Size

Key to Ungulates


Animal does not have horns or antlers.
Animal has horns or antlers.
Animal has horns, not antlers.
Horns, brown, in Males heavy to massive, curling back in spiral.
Females, horns thinner, backward curling.
Not as above.
Animal has antlers, generally "deer-like" in appearance.
Antlers are palmitate. (Wide, flat, heavy and horizontally spread)
Antlers not as described above.
Antlers less prominent, thinner.
Antlers prominent, heavy, wide branching off main beam up and to the rear.


Antlerless Ungulates
Thinhorn Sheep
Bighorn Sheep
Horns slender, black, with slight backward curve.
Mountain Goat
Moose
Antlers thin, forward sweeping, unbranched tines on main beam.
White-Tailed Deer
Antlers upright, not forward sweeping.
Antlers upswept, branching, no prominent brow tine.
Mule Deer
Antlers upswept, branching, V-pronged tines, prominent brow tine.
Caribou
Elk

INDIVIDUAL SPECIES

Key to British Columbia Ungulates

The ungulates of British Columbia have two major characteristics in common:

a. All are even-toed or split hoofed animals. They have a large pair of hooves that the animal walks on and a small pair on the underside of the ankle that serve no apparent function.

b. All are ruminants.

They are split into two major groups: those with horns or bovids, and those with antlers or cervids. The bovids include the bighorn and thinhorn sheep and the mountain goats. The cervids include the deer, caribou, elk, and moose.

The species will be discussed individually, but where there are characteristics in common for a group of species a comment will precede the individual descriptions.

Sheep

Two of the five main types of wild sheep are found in North America—the thinhorn sheep of the north and the bighorn sheep of the south.

Bighorn Sheep

There are two types of bighorn sheep—the Rocky Mountain and the California.

Colour: The two bighorn subspecies are very similar in appearance, being brown with white on the belly, the insides of the legs, and the rump. The white rump is a striking feature that enables the sheep to be spotted at a great distance. Part of the muzzle usually is also white. The tail is small and dark, contrasting strongly with the light rump.

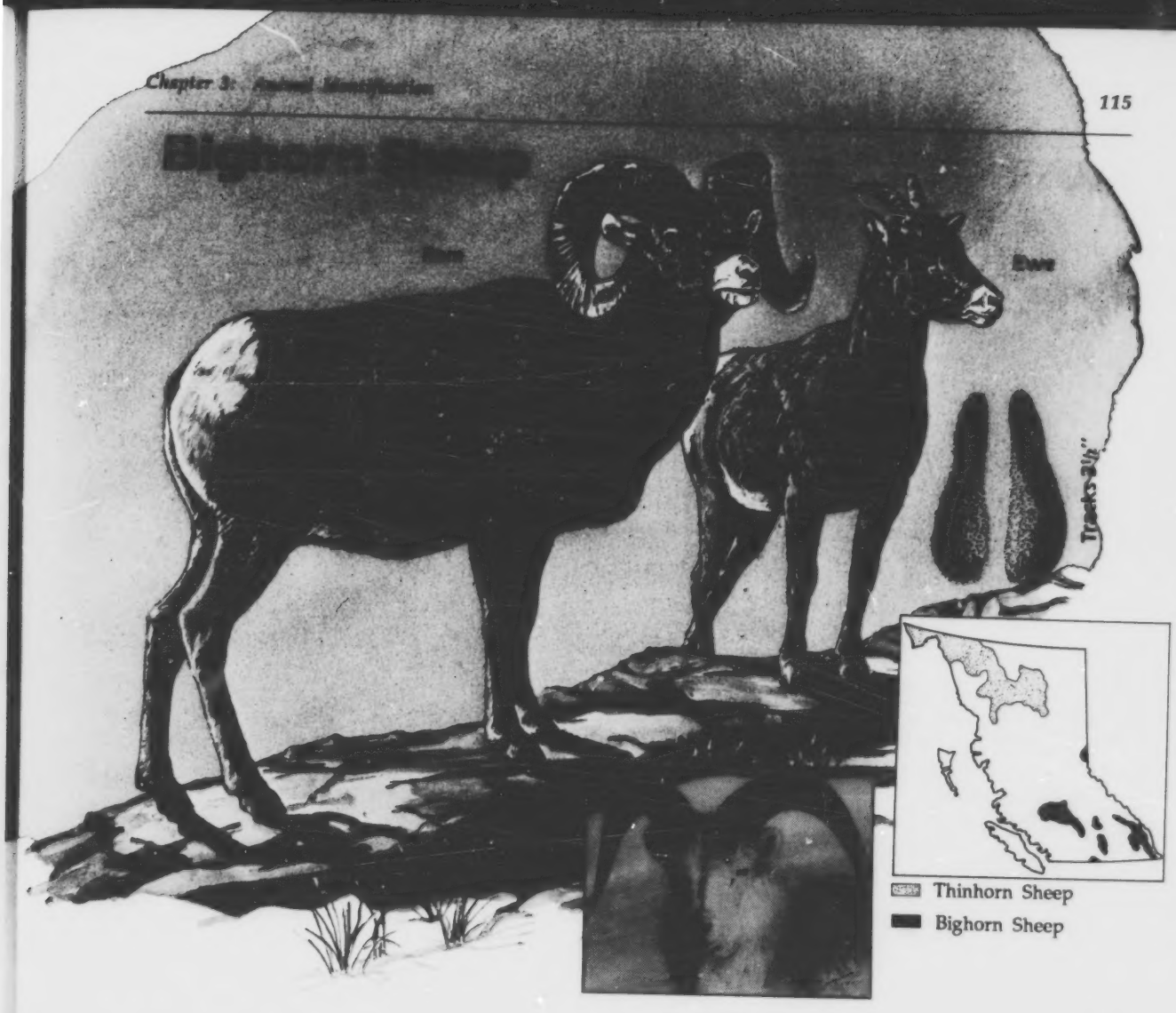
Body size and characteristics: A large ram will stand about 42 in (105 cm) at the shoulder and weigh around 300- 325 lbs (135 - 145 kg). The California bighorns tend to be smaller than the Rocky Mountain variety.

Horns: At short distances a distinctive feature of the mature male is a set of massive horns which spiral backwards from the top of the head, curling down around the small ears and then upwards above the nose as the animal grows older. The horns continue to grow throughout the life of the animal, and because growth stops for part of the year, annual rings indicating the age of the animal occur. An old male may have horns that complete a full circle, although the tips are often broken or "broomed". The horns of the female are much less impressive, being thin and erect much like the horns of female domestic goats. The California bighorn often has a more open horn curl than the Rocky Mountain bighorn.

Habitats: Mountain slopes with sparse growths of trees and rugged terrain. They move to lower elevations in the winter. They are both a browser and grazer and feed on a great variety of plants.

Distribution: The Rocky Mountain bighorns occur in two separate locations in British Columbia: in the Rockies from the U.S. border to Golden, and in scattered bands north of Mount Robson. In addition, two bands have been established from transplants, one at Squilax and the other at Spences Bridge. The California bighorn is confined to the Okanagan, Similkameen, and mid-Fraser River basin areas. A reintroduction was made north of Kamloops Lake.

General comments: Sexes usually separate in the summer and the rams join the ewes and lambs in the fall. They are usually found in herds; a solitary sheep is usually sick or injured.



Dall Sheep

Thinhorn Sheep

There are two types of thinhorn sheep: the Dall and the Stone.

Colour: Dalls are the only white wild sheep in the world, but they are not true albinos since they have the golden eye common to all mountain sheep. The hooves and horns are pale with a yellowish tinge and present a striking contrast to the white coat.

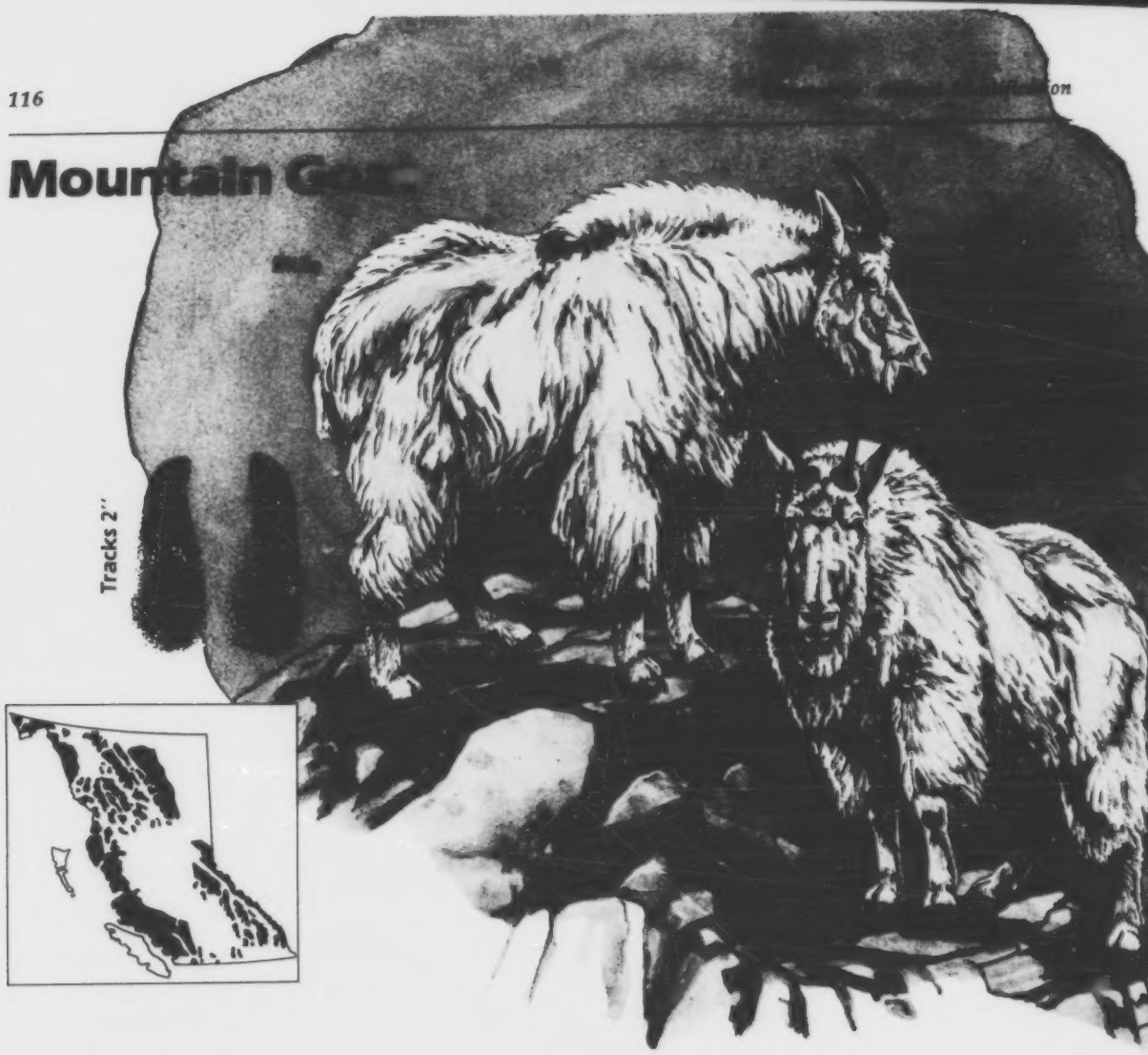
Stone sheep tend to be very dark except for white on the face, abdomen, inside of the legs, and rump patch. Their horns are midway in colour between the brown of the bighorns and the yellow of the Dall. They may be much paler because of mixed breeding and sometimes only the saddle, tail, and lower legs are dark.

Body size and characteristics: Dall sheep are 3 - 3 1/2 ft (1 - 1.2 m) tall and weigh 125 - 200 lbs (57 - 90 kg). They are stocky.

Habitats: Rough terrain and mountain slopes. Usually in bands of 6 or more.

Distribution: They are found in the northern part of the province. The Dall sheep is mainly in the Yukon and Alaska but occurs in the far north-western part of British Columbia.

Mountain Goat



Mountain Goat

The mountain goat is not actually a goat but is a mountain dwelling antelope related to the chamois of the Alps.

Colour: They are entirely white throughout the year. At times, however, they may appear yellow or off-white as their hair becomes stained or soiled.

Body size and characteristics: They appear blocky in profile. Long rough hair runs in a ridge from their shoulders to their rump and down to the ankles on both the front and hind feet. They have black hooves. More long hair on their throats gives them a bushy beard. Both the males (billies) and females (nannies) have the same profile; the males are usually slightly larger. They are 3 - 3 1/2 ft (90 - 105 cm) high and weigh 100 to 300 lbs (45 - 135 kg).

Antlers/horns: Both males and females have slender, black horns; the males horns may be slightly larger.

Habitats: They are found on steep slopes and benches along cliffs, usually at or above the timberline. They are usually in small bands but mature billies may be seen alone. They are part grazer and part browser and feed on various high mountain vegetation,

including grasses, herbs, and bushes. They prefer dwarf willows. They are usually above the timber line in summer and move to lower elevations in the winter.

Distribution: Present distribution covers several of the western United States and Alaska. In Canada, mountain goats are found in Alberta, Yukon Territory and British Columbia. B.C.'s population of approximately 100,000 is by far the largest of any of the states or provinces.

General comments: Along with the Dall sheep and polar bears, they are the only large mammal that is completely white throughout the year for their entire lives.

The Deer Family

The deer family, *Cervidae* are hoofed mammals that have antlers and are ruminants. They include deer, elk, moose, and caribou.

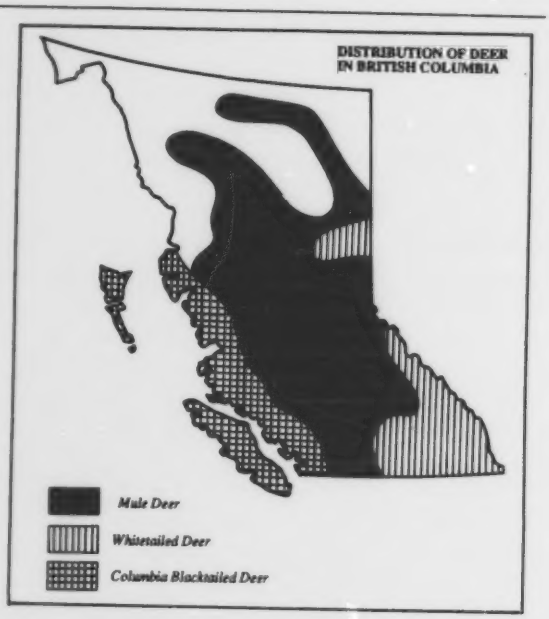
Deer

Deer are abundant throughout all except the extreme northern and north-western portions of the province. The deer native to B.C. include the Mule deer, the Columbia black-tailed deer, and white-tailed deer.

Predators of deer include cougar, domestic dogs, wolves, coyotes, lynx, bobcat and bear, probably in that order of importance, Fawns are particularly vulnerable, although 'predation' is an important natural process that serves to 'weed out' sick and weak animals from the prey population. Larger predators scatter herds on wintering ranges to some extent, thereby achieving wider utilization of browse.

Deer may be in competition for food with cattle, sheep, elk and moose.

It is usually only in the spring that deer feed on grass, and at this period they are in competition with cattle and other grazers.



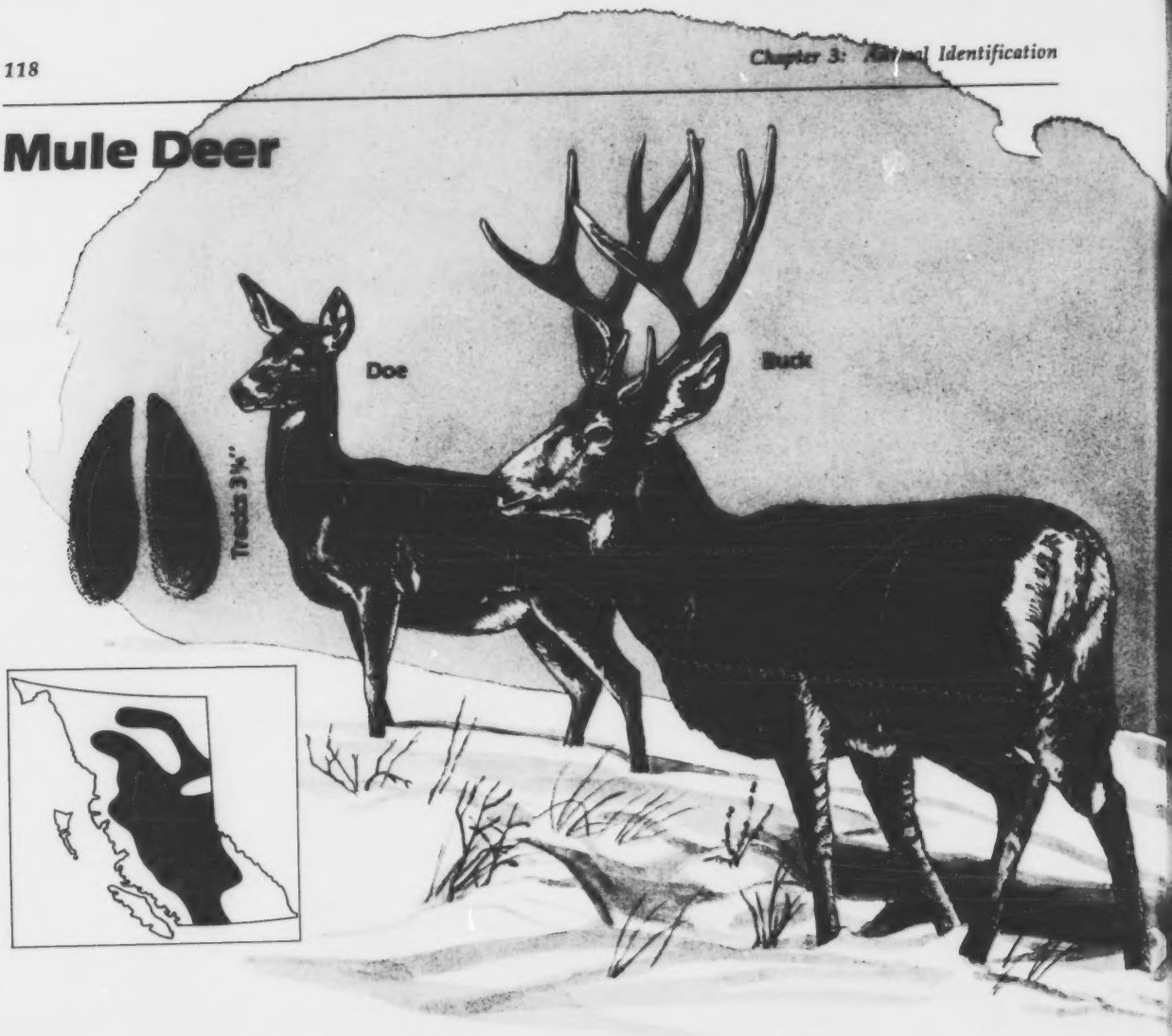
While deer and moose eat many of the same foods, at the critical winter period deer and moose are separated to some extent by the deer's inability to move easily in snow deeper than about 1 1/2 feet (.5 m).

Mule Deer

Colour: Deer are brownish in colour. Mule deer have a large white rump patch and a slender white tail that is tipped with black hair. The males in winter are usually grayish brown, while the females and males in summer are reddish brown. They are yellower than white-tailed deer. They have a light face and muzzle with a dark forehead.

Body size and characteristics: Male mule deer weigh between 200 to 250 lbs (90 - 115 kg) but can weigh up to 405 lbs (205 kg). Does are smaller and rarely exceed 160 lbs (70 kg). Mule Deer have large ears. They bounce high and stiff-legged as if on springs; because of the great distance covered with each bound the mule deer appears to spend most of its time in the air. The fawns and does though seldom heard make a bleat; bucks have a guttural grunt, especially during the rut; both sexes snort when alarmed.

Mule Deer



Antlers/horns: The antlers of the male mule deer grow in forked pairs.

Habitats: The mule deer lives in coniferous forests, desert shrubs, chapparrals, grassland with shrubs occupying several types of habitat. They browse on shrubs and twigs, and add grass and herbs at times. The mule deer are most abundant and are found east of the Coast Mountains throughout the remainder of "deer country" in the province.

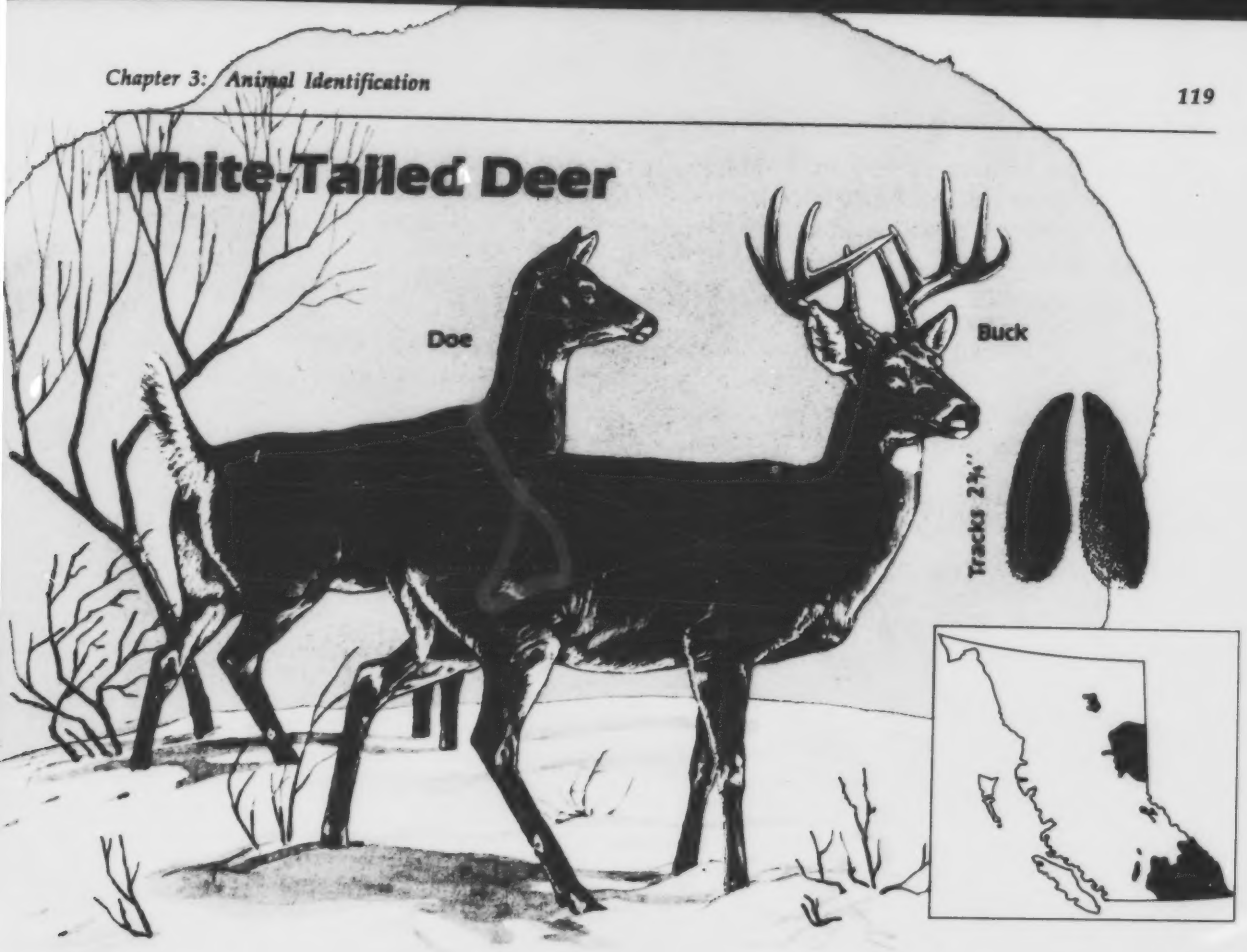
General Comments: Mule deer are more curious than the white-tailed deer and are often seen in open areas. When running for cover, they often pause to look back, giving the hunter a good opportunity for a standing shot.

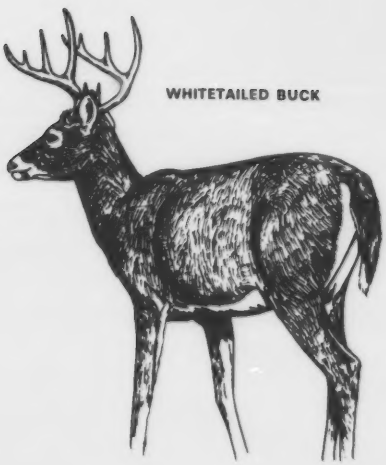
Black-tailed Deer

Colour: Black-tailed deer have almost no rump patch and a broad tail that is either brown or black on top and always has a black tip with a white underside. Coloration of the black-tailed deer is warm brown to gray brown. The facial markings are subdued; they have a light face and muzzle but do not have a very dark forehead.

Body Size and Characteristics: Black-tailed deer are the smallest of the three types; the bucks weigh from 150 - 300 lbs (70 - 140 kg) and the does between 100 - 130 lbs (45 - 60 kg). They have smallish ears and almost no rump patch. When running they bounce like a mule deer but usually hold their tail straight out.

White-Tailed Deer





Antlers: The antlers of the male black-tailed deer grow in forked pairs but lack the vast number of possible tines that can grow on mule deer.

Distribution: Black-tailed deer are found west of the Coast Range on Vancouver Island and associated Gulf and Queen Charlotte Islands, and overlap the mule deer range in isolated places in the Coast Mountains.

White-tailed Deer

Colour: White-tailed deer have a broad, long tail that is cinnamon colour on top and white on the underside. When the tail is raised, the deer presents a large, flashing white rump patch and under-tail. The white-tailed deer is generally a cinnamon coloured deer with a darker face than the other two.

Body Size and Characteristics: White-tailed deer are mid-way in size. The white-tailed deer runs with undulating leaps with their broad white tails flagging. Their voice is rarely heard; it is a low bleat by fawns, guttural grunts by old bucks in rut; and both sexes snort when alarmed.

Antler/horns: The white-tailed male has antler tines that grow upward from a single forward-growing main branch.

Habitat: The white-tailed deer lives in forests, swamps, and the open brushy areas nearby. They eat twigs, shrubs, fungi, acorns, and grass and herbs in season. They live in groups of up to 25 in winter and singly in summer.

Distribution: White-tailed deer are found only in the south-eastern portion of the province and the Peace River area, and are expanding into regions in the Peace River and Okanagan-Similkameen areas.

General Comments: White-tailed deer are most often seen in early morning or late afternoon when they move out on the edge of open areas to feed. At other times they stay in thick bush.

Moose

Colour: They are dark brown with grayish legs and at a distance appear black.

Body size and characteristics: Moose are 5 - 6 1/2 ft (150 - 195 cm) in height. The males weigh 850 - 1180 lbs (380 - 530 kg) and the females are 600 - 800 lbs (270 - 360 kg).

A pendant of hair-covered skin called a bell hangs from under the throat and is variable in size and shape. There is a distinctive hump over the shoulders of the moose. The hind quarters are slim and set lower than the front quarters. The tail is short and not seen at a distance.

Antlers/horns: The male's antlers have massive, palmate, flat concave plates with small prongs projecting from the borders.

Habitats: Moose live in forests with lakes and swamps, singly or by twos or threes. They browse on many woody plants in winter, twigs, bark, saplings; and feed at dawn and dusk on aquatic vegetation in summer. In winter, particularly in years of deep snows, moose tend to concentrate in the willows and shrubs along river valleys or other low areas.

Distribution: Moose are found in the spruce forest and have a wide range in British Columbia that is increasing with logging and other intrusions. Not found on Coast Islands.

Moose are quite new in the Central Interior of British Columbia, and very few of these animals were to be found south of Prince George until after the turn of the century. Early explorers saw few moose during their travels. It was not until shortly after 1900 that the great southerly migration began in earnest.

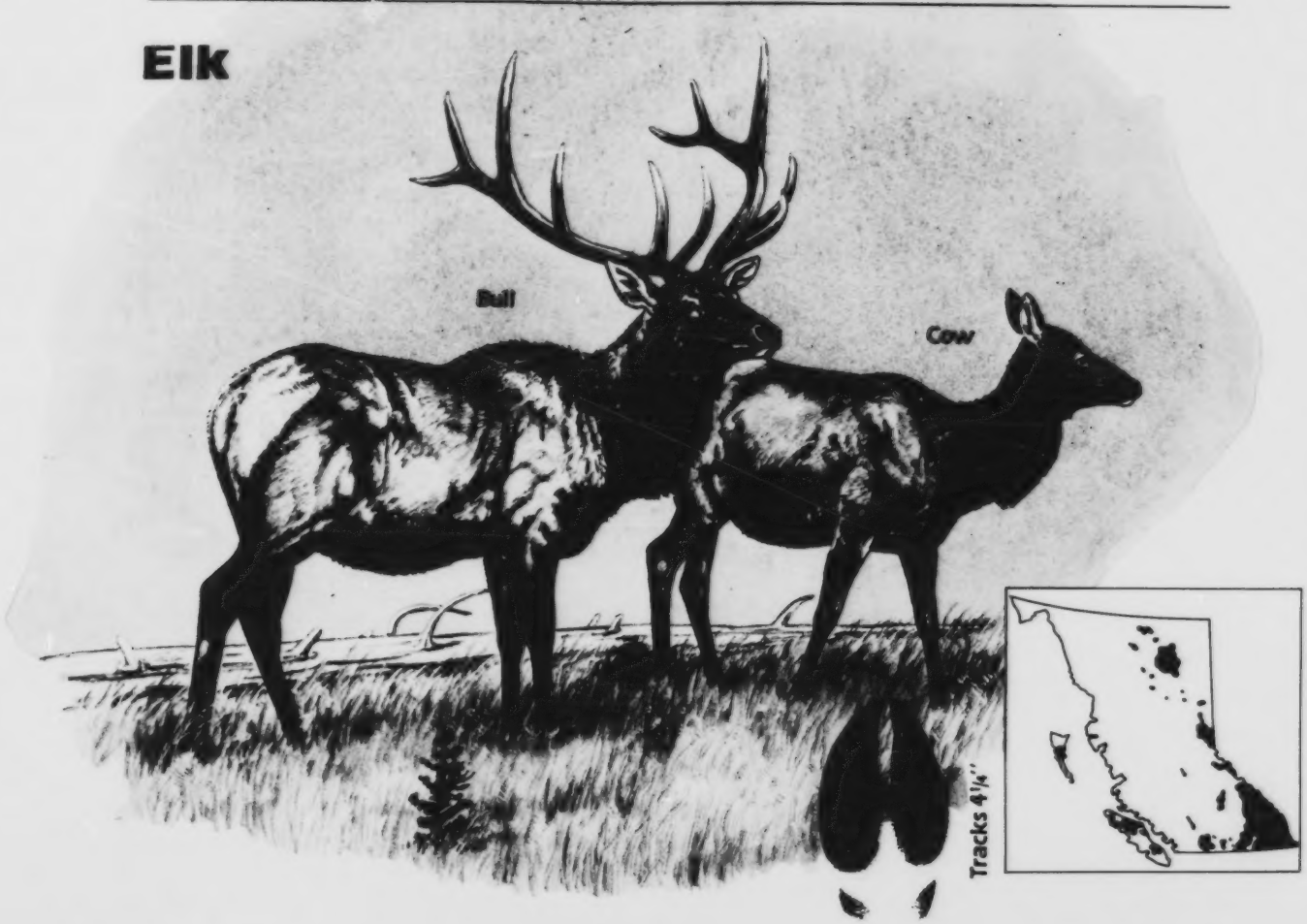
Moose

The reason for the southward drive was the new presence of suitable food. Activities of early settlers and miners in cutting and burning the dense forests which were present changed the face of the land. Huge areas, once heavily forested, were opened up and moose moved in.

General Comments: Because moose are not normally a far ranging species, without protection, local populations may be quickly depleted because of easy access by hunters.

During the fall mating, or rutting season, bull moose will grunt and bellow. Both bulls and cows will respond to a hunter's skillful imitation of these sounds.

Elk



Elk

Colour: In summer, elk are a reddish-bay colour with darker legs, head, and neck. They have a large "rump patch" that is cream in colour and contrasts with the rest of the body. There is a colour change by August; their body colour is distinctly tawny and their head, neck, and legs dark brown. The rump patch remains creamy coloured and distinctive.

Body size and characteristics: Elk are 4 -5 ft (120 - 150 cm) tall. The males weigh 700 - 1000 lbs (315 - 450 kg) and the females 500 - 600 lbs (225 - 270 kg). They are smaller than moose, much larger than deer and only slightly larger than caribou.

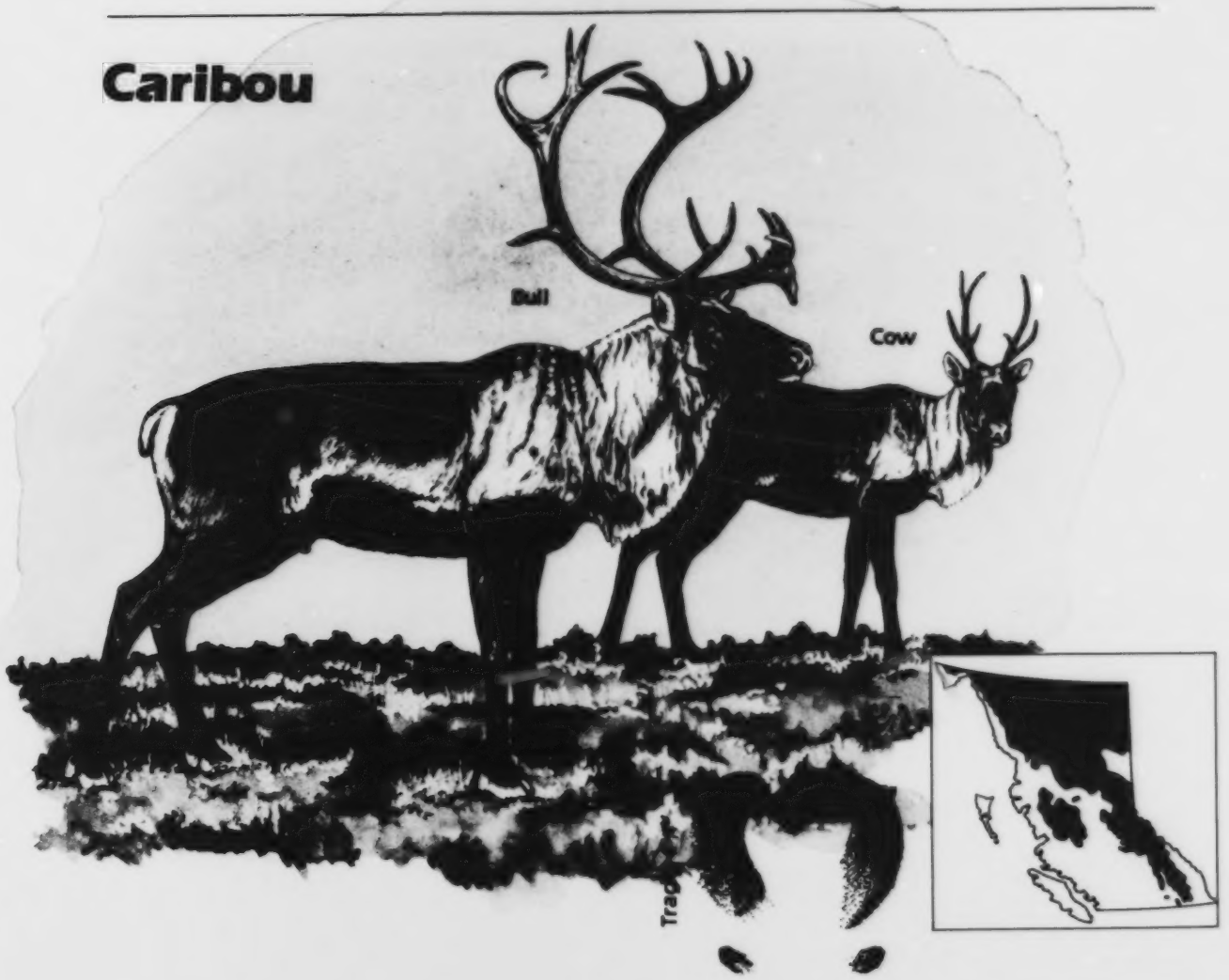
They have a characteristic "alertness" of appearance that comes from holding their head high as they move. After August the hair on the neck and throat grows longer to form a characteristic dark mane. The calf has a high-pitched squeal when in danger; the cow has a similar squeal, also a sharp bark when travelling with a herd; males have a high-pitched bugling call that starts with a low note and ends with a few low-toned grunts and is generally heard during rutting season, especially at night.

They are usually seen in groups of 25 or more. Both sexes are together in the winter but in summer the old bulls form a separate group.

Antlers/horns: The antlers of mature males consist of a long, round beam that sweeps up and back from the skull. The normal number of tines is six, usually located as: two long tines above the forehead, a long tine on the lower half of the beam, and a long heavy tine near the base of the antler. The fifth and sixth tines usually point in opposite directions and are the end of the antler. The antlers of mature males usually start growing in early May and are complete by late August. They are not shed until late March or April.

Habitats: They live in semi-open forest, mountain meadows in summer, foothills, plains, and valleys. They are most active in mornings and evenings and feed on grasses, herbs, twigs, and bark. In severe winters when grazing is difficult elk will browse for food and may even strip and eat trees.

Distribution: Elk are abundant in several mountainous regions in the province. Roosevelt elk have been found only on Vancouver Island but are currently spreading in the Skagit Valley-Cultus Lake area. Rocky Mountain elk are found in the Kootenays and the Rocky Mountain Foothills in the South Peace River area as well as the Muskwa River area. They have been transplanted to Moresby Island in the Queen Charlotte Island chain and the Bridge River, Adams Lake, Naramata, Princeton, and Squamish areas.



Caribou

Caribou are wild reindeer similar to the wild and domesticated reindeer of Eurasia. Although there is only one species of reindeer in the world, two distinct types occur in Canada: the woodland caribou and the tundra caribou. In British Columbia, we have only the Woodland Caribou.

Colour: Caribou are generally a dark chocolate brown with limited white areas on the belly, rump and lower legs, and larger white areas on the neck.

Body size and characteristics: They are large and have long legs. They have large, concave hooves that splay widely to support the animal in snow or muskeg, and function as efficient scoops as the caribou paw through snow sometimes a metre deep to uncover lichens.

The woodland caribou is 3 1/2 - 4 ft (105 - 120 cm) high. The males weigh 250 - 600 lbs (115 - 270 kg) and the females 150 - 350 lbs (65 - 160 kg). Woodland caribou, a creature of the forest, seek the seclusion of mature spruce and other coniferous forests or remote alpine meadows. They are not great travellers and may move only a few miles from summer range of alpine tundra

to winter range in timber lower on a mountain side. In more level areas of the boreal (northern coniferous) forests, they may graze and browse limited areas of bogs, low-lying grassy areas, or lichen-rich glades, and move perhaps only a short distance to a winter area where tree and ground lichens are available. They do not form large herds, but they are sociable, seldom travelling alone.

Antlers: Caribou are the only ungulate of which the male and female carry antlers. Caribou antlers are different from other deer in that one or two heavy tines called "shovels" extend outward from the animal's brow. The main stem of the antler extends back, up, and out to the side. Caribou antlers are flatter and wider than those of the mule and white-tailed deer.

In the woodland caribou all the males and more than half of the females have antlers. They are semi-palmated with one prominent brow tine down over the nose. The antlers are dark mahogany brown with flattened beams. The velvet is dark brown.

Habitats: The woodland caribou lives in old coniferous forests and muskegs. They are usually in small bands and browse on a great variety of plants.

Distribution: Caribou are found in Canada from the United States/Canadian boundary in Ontario and British Columbia to northern Ellesmere Island more than 2,400 miles (3,800 km) north. In the northern half of British Columbia, caribou are found east of the Coast Mountains to the east foothills of the Rocky Mountains. In the southern half of the province, caribou generally occur in the Columbia and Rocky Mountains and range west (Selkirk and Monashee Mountains) except in the southern portion of the Rockies in southeastern British Columbia. Caribou are also found in the southern part of the Hazelton Mountains south through Tweedsmuir Park.

General comments: The animal most closely resembling the caribou is the elk, but even at a distance the caribou's distinctive brow tine, large feet, light mane, and habit of holding its head low when moving are unmistakable features.

Key to British Columbia Carnivores

Carnivores are meat-eating mammals which have teeth along the sides of their jaws for cutting or shearing their food. Bears have different teeth from other carnivores; their teeth are flat-topped and are similar to those of humans; they crush rather than shear food.

Large carnivores are generally cat-like (cougar, lynx, bobcat), dog-like (wolf, fox, coyote), or bear-like (grizzly, black bear) animals.

Cat-like Carnivores

Except for colour and size, all cats look alike. They have short faces and small rounded ears. They have five toes on each front foot, and five on the back feet. They have retractable claws.

Cougar

The cougar is also called mountain lion.

Colour: The young have widely spaced black spots on a buff coloured body; these spots disappear entirely when the animals mature and adults are generally plain in colour. The upper parts of the body (head, neck, legs, back, and tail) are brownish, grayish, or reddish. The belly and rump is white often overlain with buff. The chin and throat are white and the ears are black; there is a black patch at the base of the whiskers and the tip of the tail. Their eyeshine is greenish gold.

Body size and characteristics: The cougar is a large cat with slender form, long cylindrical tail, short ears and prominent whiskers. A mature cougar is about 26 - 30 in (65 - 75 cm) high at the shoulders, 6 - 7 ft (180 - 210 cm) long (3 ft (1 m) of which is tail) and weighs from 100 - 200 lbs (45 - 90 kg). It is much larger than other cats in the province.

Cougar

Tracks 3"

Their long powerful legs have five toes on the forepaws and four on the hind paws; each toe has long claws. The claws are retractable, sharp, and are strongly curved to hold living prey or for climbing trees. Except for the naked pads, the feet are well haired to aid in the silent stalking of prey. Their voice is like an ordinary tomcat, but much magnified.

Habitats: Cougars prefer mature and second growth forests of rocky and mountainous terrain, but may also be found along the seashore and on estuaries. Cougars prey mainly on deer, but also on elk, moose, and mountain sheep. Beavers, mice, squirrels, porcupines, varying hare, and birds also form part of their diet.

Distribution: Cougar are found south of the Skeena and Peace Rivers in the Coast Mountains, Interior Plateau and Rocky Mountains. They are also on Vancouver Island.

Lynx

Colour: The lynx is almost solid grey and has a short grayish tail with a definite black tip on both top and bottom.

Body size and characteristics: The lynx is 32 - 36 in (80 - 90 cm) long with a 4 in (10 cm) tail. They can weigh up to 40 lbs (18 kg) and are larger than the bobcat. The feet are large, 9 in (22 cm) or longer and the pads are light-coloured. They have long, tassel-like ear tufts. They are primarily nocturnal and solitary.

Habitats: The lynx habitat is mixed deciduous and conifer forests where it usually remains in or near the cover on burned areas and natural forest clearings. Its food consists primarily of the varying hare, but rodents, birds, and the young of deer, moose, and caribou are also preyed upon.

Distribution: The lynx occurs throughout British Columbia east of the coast range.

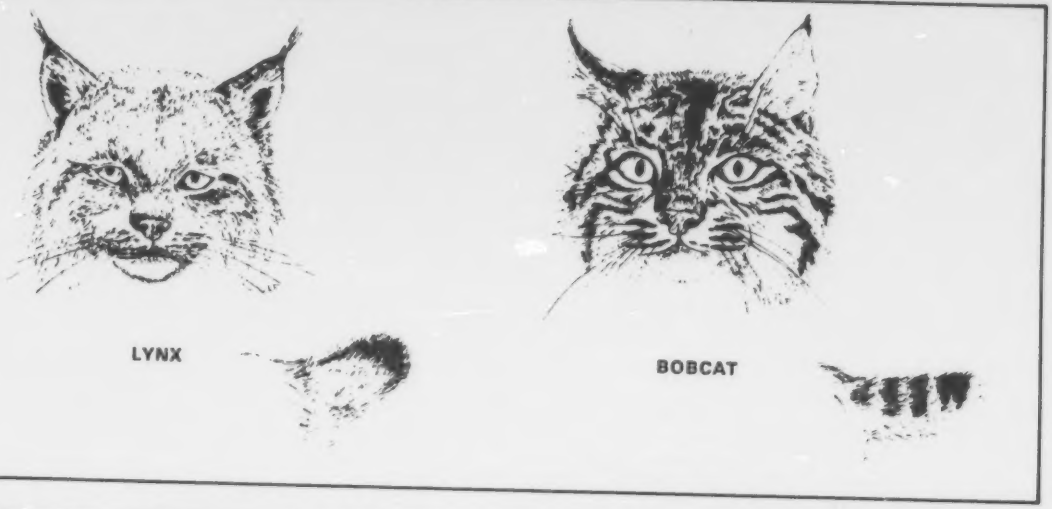
Bobcat

Colour: The coat of the bobcat is short, buffy and much spotted. The short tail is black spotted on top with a tip that is black on the top only.

Body size and characteristics: They are 25 - 30 in (65 - 75 cm) long with a 5 in (12 cm) tail. They weigh 15 - 35 lbs (6 - 16 kg). The ear tufts are short and inconspicuous. Their feet are small (up to 7 in (24 cm)) and black underneath.

Habitats: The bobcat is a southern cat and prefers brushland or semi-wooded country. It occurs from valley bottom to timberline though it generally is found in mixed cover at lower elevations or in half open country with alternate clearings and brushy patches. They prey mainly upon rodents, varying hare, birds, and fawn deer.

Distribution: Bobcats are found south of Finlay Forks in the Rocky Mountain Trench, southward on the Interior Plateau, on the coast from Bute Inlet southward, and in the Rocky Mountains from Mount Robson southward. They are absent from the coastal islands.


LYNX
BOBCAT

Wolf

Dog-like Carnivores

These animals are dog-like in appearance. They have five toes on each front foot (the inside toe is high) and four toes on each back foot. They have a scent gland at the top base of their tail; this is covered by black-tipped hairs.

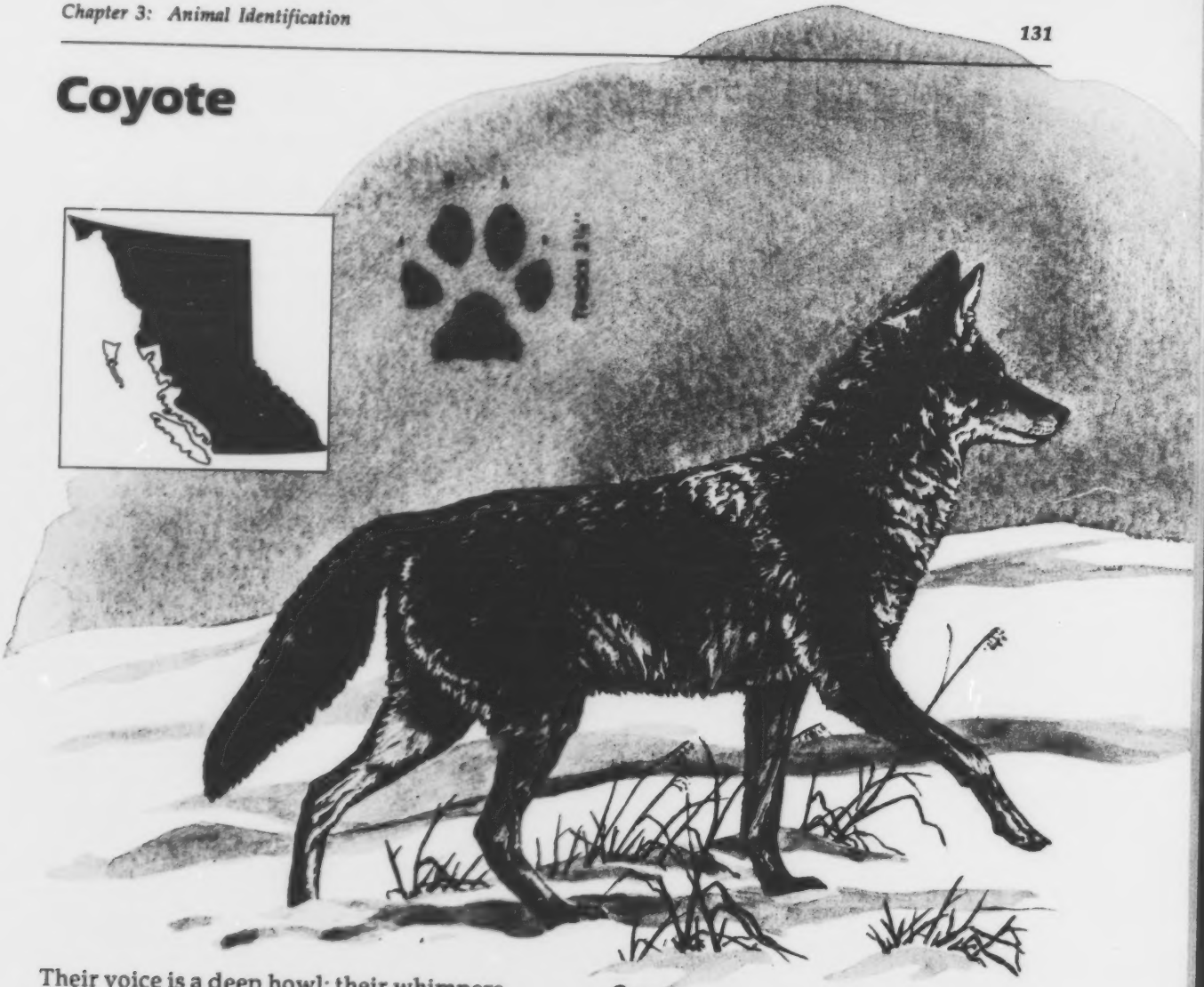
Wolf

Colour: Wolves are usually grey in colour with a sprinkling of black. The hair of the muzzle, forehead and back is always darker than the sides and belly region which are yellow-white. The coloration is much more variable than that of the coyote. Their eyeshine is a greenish orange.

Body size and characteristics: The wolf is the largest member of the dog family in British Columbia. Their head and body is 43 - 48 in (108 - 120 cm) long, with a 12 - 19 in (30 - 48 cm) tail. They are 26 - 28 in (65 - 70 cm) tall at the shoulder. They weigh 70 - 120 lbs (32 - 54 kg). They have a lithe, muscular, deep-chested body, long slender legs, a bushy tail, a long slender muzzle, and large erect ears. They have a wider nose-pad and are larger and heavier than coyotes.

They carry their tails high while running (coyotes carry their tails below the level of their backs). They have an acute sense of hearing, sight, and smell. They hunt mainly by scent and usually obtain their prey by a swift, open chase.

Coyote



Coyote

Their voice is a deep howl; their whimpers, whines, and growls are not normally heard by people.

Habitats: They live in forest areas. They are social animals and a pack may contain three or four to 24 animals. They usually hunt together and can kill animals as large as deer, elk, caribou, or moose. They also eat smaller animals such as beaver, muskrats, mice, and varying hare, and will eat carrion.

Distribution: They are found in much of British Columbia with the exception of the Queen Charlotte Islands and a large part of the Interior Plateau and Kootenay regions where they have been exterminated.

Colour: The coyote is usually grayish-fawn, white or almost so on the throat and belly, with heavy dark-tipped hairs on the back and tail. The "hackles" above the shoulder blades consist of longer, black-tipped hair. Their eyeshine is a greenish gold.

Body size and characteristics: Coyotes stand about 23 - 26 in (58 - 65 cm) at the shoulder, are 32 - 37 in (80 - 93 cm) long with a 11 - 16 in (28 - 40 cm) tail. They weigh about 20 - 50 lbs (9 - 23 kg). They have a slender, narrow chest and longer legs than most dogs. The muzzle is long and narrow; the ears are long and pointed. The tail is bushy

and carried low and close to the hind legs, unlike the wolf which carries its tail high.

In the evening a series of high pitched yaps may be heard.

Habitats: They are found in open prairie, parkland, alpine meadows, and desert areas.

Except during the summer, when parents are teaching the pups to hunt, coyotes usually hunt alone or in pairs; they do not hunt in packs like wolves. Prey consists principally of hares, rodents, and birds; but it appears that anything that is edible, either vegetable or animal can become part of their diet. Carrion is an important source of food and the remains of dead livestock, waterfowl, and deer are readily eaten when available. They sometimes prey on disabled, injured, or sick deer.

Distribution: They are located throughout British Columbia east of the coastal areas and on the Fraser Delta.

Red Fox

Colour: Colour varies from pale yellowish red to deep reddish brown. In addition, silver or black colour phases may occur. The belly and chest are white, the lower part of the legs are black and the bushy tail is tipped with white or black.

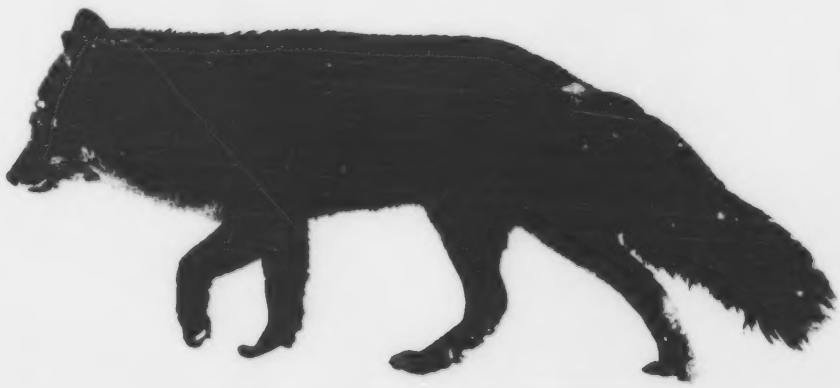
Body size and characteristics: A fox is 15 - 16 in (27 - 40 cm) high at the shoulder and weighs from 6 - 15 lbs (2.5 - 68 kg). They have large pointed ears, sharp elongated muzzles, and bushy tails that are as long as their bodies.

Habitats: They inhabit both the boreal forest regions and the conifer and deciduous forests of hills and mountains. They are animals on the "edge", inhabiting parklands, alplands, lake and river shores, logged-off areas, and farm lands.

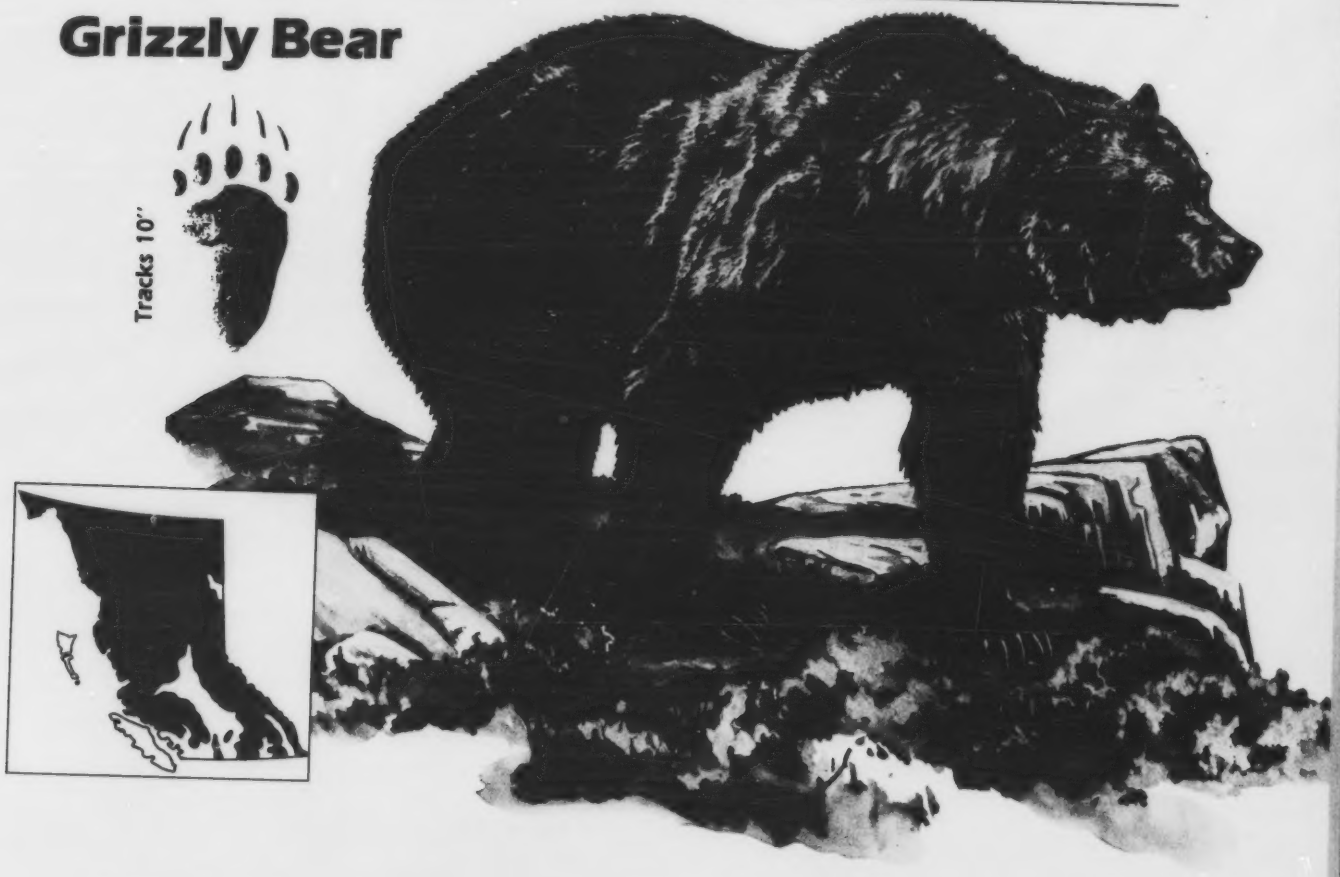
They are omnivorous, eating such varied items as small mammals like mice and voles, small birds and waterfowl, insects, eggs, grass, and fruit.

Distribution: They are found throughout British Columbia east of the Coast Mountains and on Vancouver Island.

Red Fox



Grizzly Bear



Bear-like Carnivores

These are the largest living land-dwelling carnivores. They walk on the entire foot and have five toes on both the front and back feet. They have short tails that are almost hidden by their fur. Their ears are small and rounded.

Grizzly Bear

Colour: Grizzly bear coloration ranges from blond through all shades of brown and black. Some bears with darker underhair have long blond or white guard hair on the shoulders and back; it is this coloration which gave rise to the name grizzly or silvertip. Body size and characteristics: The head and body height can be 6 - 7 ft (180 - 210 cm) tall. They are 3 - 3 1/2 ft (1 metre) at the shoulder. They weigh 325 - 850 lbs (150 - 385 kg). They are medium to large size bears.

They have three distinguishing characteristics. First, they have a shoulder hump above the shoulders. Second, they have a concave or dish-faced profile, unlike the straight face of black bears. Third, they have long curved claws on their front feet. These claws make it impossible for the adult to climb trees like black bears.

The mature grizzly has a heavy hide covered by a pelage of soft, thick, under-fur and long guard hairs that give it a shaggy appearance.

Habitats: They live in mountainous and wilderness areas, except on the coastal islands. In the coastal regions they inhabit the conifer forests along salmon spawning

Tracks 7"

streams. In the interior they are usually found at higher altitudes around rock slides, talus slopes, sub-alpine openings, and past forest fire openings where berries and rodents prevail.

They are omnivorous and eat any available animal, carrion, or succulent vegetation.

Distribution: Remote mountainous and wilderness areas of the province. Not found on the coastal islands.

General comments: They are solitary animals, particularly the males. The cubs remain with the mother for up to three years.

Black Bears

Colour: Black bears are not necessarily black. Commonly they are either glossy black, with a brown snout and a white patch on the chest, or brown with a lighter snout, but various shades of black, brown, and white occur regularly. Body size and characteristics: Although the black bear is the smallest of the bears, it is nevertheless a large animal. Its head and body are 5 - 6 ft (150 - 180 cm) high, and it is 2 - 3 ft (60 - 90 cm) at the shoulder. They weigh 200 - 475 lbs (90 - 215 kg) or more and move with a with a flat-footed shuffling gait.

Habitats: They can be found in all habitats from coastal beaches and estuaries to dry grasslands, forests, and sub-alpine and alpine areas. They prefer open forests where thickets of timber provide cover and seclusion, and intermittent open areas (such as those caused by forest fires) which provide fruit bearing shrubs, lush grasses, clover, and other succulent plants.

Distribution: Widely distributed in the province.

General comments: They are solitary animals, but cubs remain with the sow for a year or more.

ANIMAL IDENTIFICATION REVIEW

1. What are the differences between antlers and horns?
2. What are the characteristics of the caribou antler?
3. What is a habitat, and why is this important to animal identification?
4. What is the habitat of Bighorn Sheep?
5. What is the distinctive feature of Thinhorn Sheep (Dalls)?
6. Describe the differences in distribution, antlers, ear and tail structure of Mule, Black-tailed, and White-tailed deer?
7. How can you distinguish between:

   elk and caribou
   bobcat and lynx
   wolf, fox, and coyote
   black bear and grizzy?

4

BIRD IDENTIFICATION

Goal

To identify game birds in British Columbia using knowledge of their characteristics, habitat and distribution.

Objectives

The student will be able to:

1. Identify the following game birds from descriptions or illustrations of their characteristics, habitats and distribution:

- Geese, four types
- Diving ducks as a group
- Dabbling ducks as a group
- Chukar Partridge
- Grey Partridge
- Ptarmigan, as a group
- Band-tailed Pigeon
- Ring-necked Pheasant
- Grouse, four types
- Common Snipe
- Mountain and California Quail
- Mourning Dove

2. Define these common terms as related to birds:

- puddle duck
- diving duck
- gallinacious
- introduced species and native species
- migratory bird
- plumage
- protected
- raptor
- speculum
- upland game birds
- waterfowl
- game bird
- sea duck
- shorebird
- eclipse plumage

3. Discriminate among birds of British Columbia which may be legally hunted and those which cannot be hunted.

INTRODUCTION

British Columbia has a rich abundance of bird life. Usually, birds are grouped or classified by their habitat requirements (e.g., waterfowl), their food habits (e.g., birds of prey) or their legal status (e.g, game birds). However, such groupings often overlap, particularly where exceptions occur. For example, the Trumpeter Swan is a non-game migratory waterfowl, and the Band-tailed Pigeon is an upland game bird which migrates.

Also, some species of birds have had a change in status as a result of new knowledge about their habits and ranges. Raptorial birds which were once considered vermin are now protected by laws. Some birds such as the White Pelican are now endangered, and are completely protected.

The Wildlife Act protects all birds found in British Columbia, but allows some to be hunted at certain times. Most migratory birds are also protected by the federal Migratory Birds Convention Act established between Canada and the United States.

Game Bird Identification

There are 11 groups or types of common game birds in British Columbia: geese, diving ducks, puddle ducks, partridge, ptarmigan, Band-tailed Pigeon, Mourning Dove, pheasant, grouse, snipe, and quail. These species will be discussed in detail with respect to their specific identification characteristics.

The following section reviews several identification techniques that hunters use to distinguish one species of bird from another. Also, it gives specific terminology used when discussing birds.

IDENTIFICATION TECHNIQUES

All hunters have a responsibility to correctly identify their targets before they shoot. You must know which species and sex are legal game and must be able to recognize them accurately. There are a number of characteristics that you can use to distinguish one species or sex from another.

Habitat Identification

The identification of a species can be directly related to its habitat.

Each type of bird requires a special "habitat", or a particular kind of place in which to live. The habitat must include breeding territories, nesting areas, brood cover, and feeding grounds. Migratory species need separate winter and summer habitats. Birds usually choose their habitats on the basis of vegetation which they use either for cover or food. Hunters must learn which species of birds they can expect to find in different habitats.

Upland game birds occupy most habitats in British Columbia, from alpine elevations to valley bottom farmlands.

Waterfowl require various types of water bodies for broodrearing and feeding.

You should understand and recognize the habitat for each species of bird.

Action

Wing beats while birds are flying and different flocking behaviour are also useful identification characteristics. For example, flying mallards form long lines, and have a slow wing beat characteristic of dabbling ducks. Canvasbacks fly in shifting, waving lines, and have a fast wing beat common to diving ducks. Snipe are usually solitary, while many other shorebirds are found in large flocks.

Colour and Shape

Bird silhouettes vary considerably. Large or small heads, broad or narrow bills or beaks, fat or slender bodies, and long or short tails are just some of the variations.

Colours are also important for identifying individual species that may look like one another. Depending on light conditions, a bird's true colour may be difficult to see, but you can often use overall patterns as a key to their identity.

Mallard

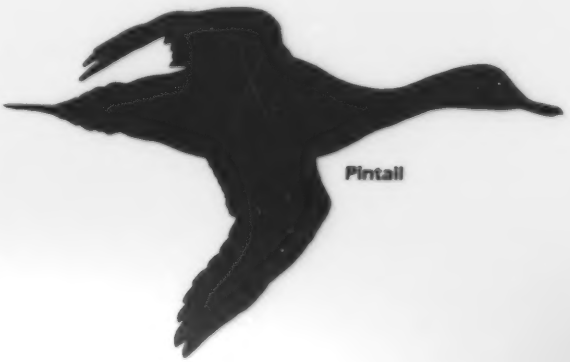
Sound

You can identify birds by the sound of their voices or calls, which might be chirps, quacks, whistles or squeals. You can sometimes identify some birds by the noise made by their wings when in flight; e.g., the whistling wings of goldeneyes.

Green Wing Teal

Protected Species

Protected species, or non-game birds, include all raptors such as vultures, hawks, falcons, eagles, and owls, as well as most smaller birds found in British Columbia. Raptors are an important part of the wildlife kingdom, as they control rodents and other bird populations. They are protected by law and must not be hunted. All other native birds in British Columbia except crows, English sparrows, European starlings, Rock Doves and magpies are protected by law year round.



Pintail

TERMINOLOGY

There are several specialized terms used when discussing birds. Some of the more important terms for hunters to understand include:

Diving Duck: "Divers" usually frequent large, deeper marshes, lakes and rivers. They feed by diving, often to considerable depths. They feed mainly on fish, shellfish, and aquatic plants and as a result are considered by some to have a very strong flavour.

They can swim a considerable distance under water to escape danger, and may emerge only far enough to expose their head or bill before submerging again.

They are commonly seen in large flocks of no distinct formation, and fly with a faster wingbeat than other waterfowl due to their stout bodies and short wings. They use their large paddle-shaped feet as rudders in flight. These are often visible when they are flying.

When launching into flight, most of this group run or patter along the water before becoming airborne. They typically land by gliding over the surface of the water.

Diving ducks are rarely seen away from water. Common divers in British Columbia include Canvasback, Redhead, Bufflehead, Greater and Lesser Scaup, Ringnecked Duck, Ruddy Duck, Barrows and Common Goldeneye, and the fish eating ducks, the Mergansers.

Eclipse Plumage: Most ducks shed their body feathers twice each year. Nearly all adult drakes lose their bright plumage after mating, and for several weeks resemble adult females. This hen-like appearance is called the "eclipse plumage". This appearance may last for a few weeks to a number of months depending on the species.

Gallinacious: Most upland game birds are "gallinacious", or chicken-like birds, such as the grouse, quail, partridge, ptarmigan, pheasant, and turkey.

Game bird: A bird which can be hunted according to hunting laws.

Introduced species: These are species of birds that were brought to North America

from another continent and introduced here. Examples include pheasants, grey partridge, and Chukar Partridge.

Native species: include birds that evolved in North America or came here without human intervention.

Migratory birds: Migratory species generally live in the north in summer and move south in the winter. The size and habitat characteristics of a migratory bird's range depends on the species.

Plumage: A bird's plumage refers to its covering of feathers. From its plumage, you can identify a species and determine its sex and age.

Protected: Protected birds are species that are looked after by laws that at all times prohibit shooting, destruction of nests or eggs, and other measures to allow the birds to live and reproduce.

Puddle duck: Also called "Dabblers", puddle ducks usually frequent shallow marshes and river edges rather than large lakes and bays. They usually feed by "dabbling" with their bills on the surface, or by tipping up and ducking their heads to grasp food in shallow water. Puddle ducks sometimes feed on croplands since they are mostly vegetarians and can walk and run on land. They are often considered to have a much milder flavour than the diving ducks.

These birds generally have a more graceful shape, longer wings and neck, and fly with a slower wing beat than most of the "divers". They take off and land more directly from the surface than do "divers". They ride high on the water and jump directly upward when taking off.

The coloured wing patch, called the "speculum", is generally iridescent and bright.

Puddle ducks will occasionally fly in formation much like geese. Common puddle ducks in British Columbia include the Mallard, Pintail, Widgeon or Baldpate, Shoveller, Gadwall, Wood Duck, Green-winged Teal, Blue-winged Teal and Cinnamon Teal.

Raptors: Raptors are predatory, flesh-eating birds, including hawks, falcons, harriers, eagles, owls, ospreys, and vultures. Once considered vermin, these species are now of interest to many people. Several species may be used under permit for falconry, for example, goshawks, red-tailed hawks, merlins, and gyrfalcon. Some species have declined because of habitat loss and environmental contamination from pesticides. All raptors are protected by the provincial government and may be captured only under specialized permits. See the section on raptorial birds in this chapter for more information.

Sea ducks: Sea ducks are diving ducks that spend most of their time outside of the nesting period on the sea coast. Sea ducks include the Harlequin Duck, Old Squaw, and the Common, White-winged, and Surf Scoters.

Shorebirds: Shorebirds includes sand-pipers, plovers, curlews, craves and snipe. Most occur on shoreline areas near water.

Speculum: The coloured patch on the wing of ducks.

Upland game birds: These birds include the gallinacious birds, doves, and pigeons. The term "upland" simply refers to where the birds are often found and pursued as game.

These birds usually have short, rounded wings, short heavy bills, and heavy bodies. They seek cover in brush or woodlands. They stay on dry ground but may live close to water. Typically these birds do not migrate

but adapt to seasonal changes, exceptions being the Mourning Dove and Band-tailed Pigeon.

Generally, males and females are easy to differentiate. Males have the more colourful plumage to attract a mate, while the female's plumage blends in with the background as camouflage.

Waterfowl: This large group of birds includes swans, geese, and ducks. Waterfowl range in size from very small ducks (such as the green-winged teal) to 20 kg Trumpeter Swans. Waterfowl are found all over British Columbia

Waterfowl are migratory birds. They nest in British Columbia or further north each spring and raise their young over the summer, migrating south in the fall.

GAME BIRDS

There are eleven groups or types of common game birds in British Columbia. This section outlines their specific identification characteristics, habitats, and distribution patterns.

GEESE

Geese and ducks are waterfowl, and as such they have many similar characteristics. For example, both have webbed feet, similar feathers, and bills of similar shape.

However, geese are generally larger than most ducks. Geese have no eclipse plumage and both sexes are identical. Most species of ducks mature by their first Spring, while geese take two years or more before reaching maturity.

Geese usually mate for life, and both the gander (male) and the goose (female) help to rear their young. If one of a pair of geese dies, the survivor will usually find a new mate.

Sex Identification: Both sexes have a similar appearance.

Characteristics: large size, drab coloration, webbed feet. In flight they tend to form a recognizable "V" or "string" pattern; they have a slower wing beat than ducks. They have no eclipse plumage. Geese take two years or more to reach maturity.

Swans, which are also large waterfowl, are generally bigger than geese, and have a distinctive call, either a "trumpet" sound or a "whistling" call. Trumpeter Swans nest in northeastern British Columbia; Tundra Swans nest further north.

Habitats: usually on or near water

Distribution: Canada geese can be found along the coast and in the interior; other geese tend to stay on the coast.

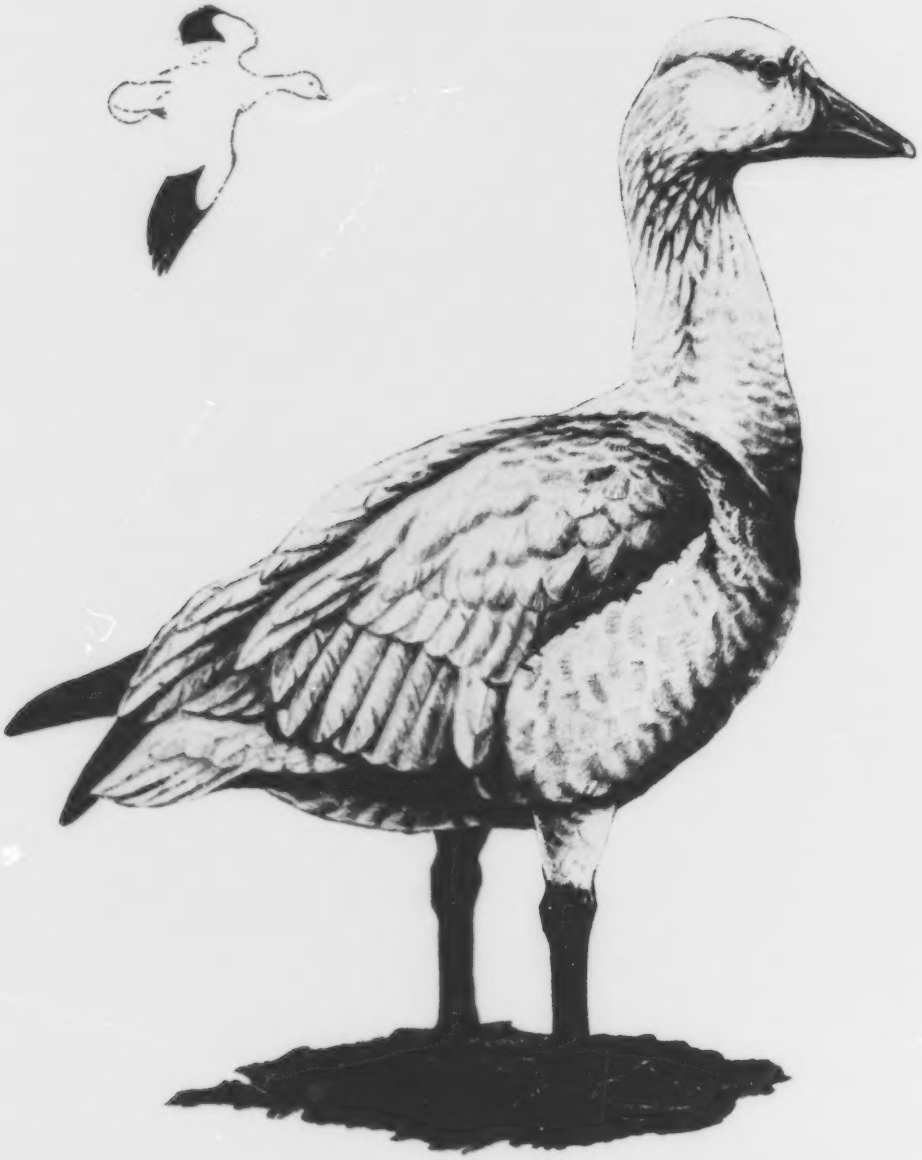
Special notes: Swans are all white or grey. Snow geese are white birds with black wing tips. Be sure of your identification.

There are four types of geese in British Columbia: the Black Brant, Canada Goose, Snow Goose, and White-Fronted Goose. Each of these is described in detail below.

Canada Goose ("Cana

The Canada Goose is one of the best known and most appreciated waterfowl in North America. It occurs in all parts of British Columbia, nesting on lakes, rivers, bogs, and marshes at the mouth of rivers. Migrating flocks are particularly noticeable and occur from the most remote alpine lakes to the most accessible urban parks. Many Canada Geese spend the winter in British Columbia on the coast and in interior valleys where food and water remain available.

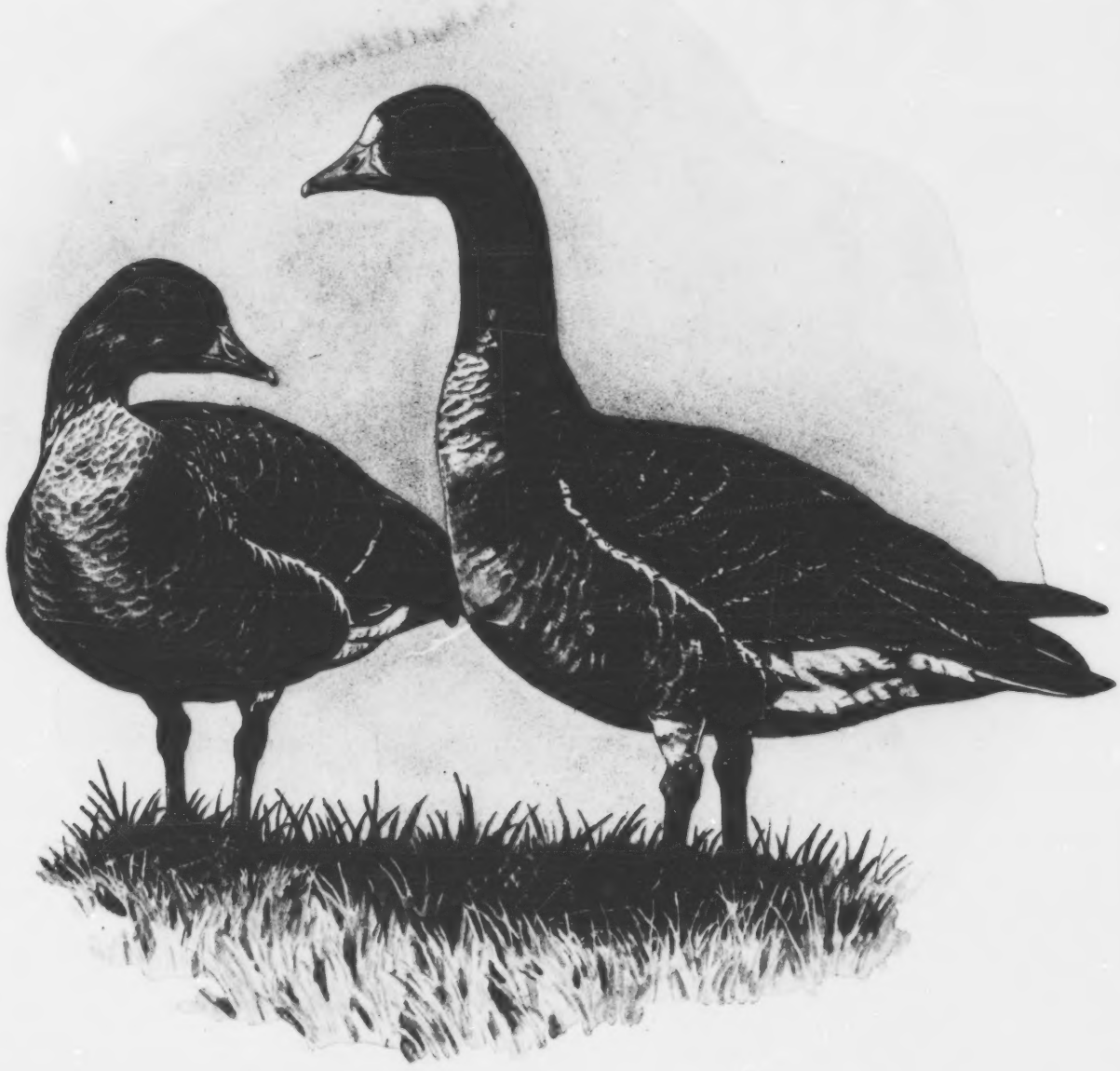
There are at least seven "types" or races of Canada Geese which occur in British Columbia. The smallest race is about 4 lbs. (2 kg), nest in Alaska, the Yukon Territory, and Northwest Territories and migrate through the interior and along the coast. Unlike the larger Canada Geese, these birds do not "honk" but rather "bark" or "cackle". The largest race is up to 18 lbs. (8 kg) nest mainly on the coast and throughout the southern half of the interior. Larger Canada Geese migrate the shortest distance and they spend the winter with Northern Geese in British Columbia, Washington, Idaho, and Oregon. Canada Geese have black heads and necks, white cheek patches, brown bodies, and white bellies. They are a social animal and usually mate for life. The young are cared for by both adults, and they form a family group until the following spring. Canada Geese do not breed until they are two or three years old.



Snow Goose **("Snowy")**

Snow Geese breed on the Arctic Coast of North America and Russia: large flocks commonly migrate down the outside coast of Vancouver Island enroute to California, and up to 20,000 birds spend the winter on the Fraser River Delta. Other flocks of up to several thousand birds migrate from Arctic Canada through the Interior of British Columbia enroute to wintering grounds on the coast of Oregon and California.

Snow Geese are all white with black wing tips: their shrill "honk" or falsetto call is a very distinguishing feature as well. They breed at 2-3 years of age and are believed to mate for life.



White-Fronted Goose
("White-front" or "Speckle-belly")

This arctic nesting bird regularly migrates in large numbers along the coast of British Columbia, but few stop or stay long. In western North America most "white-fronts" winter in Washington, Oregon, and California, and only a few remain in the Fraser Valley or on the coast of Vancouver Island. In some years, due to bad weather or tired young, the "white-front" or "speckle-belly" is force to stop in large numbers in major waterfowl areas such as Cape Scott and Tofino on Vancouver Island, and in the Fraser Valley.

White-fronted Geese are brown in colour with orange feet, a white face, and a grey-white belly speckled with black patches. They breed at 2-3 years of age and mate for life.

Black Brant ("Brant" or "Sea Goose")

The Black Brant or "Sea Goose" of Pacific North America, and the Atlantic or American Brant are not completely separated on their nesting sites in the Canadian Arctic, but separate on their wintering grounds. A few Black Brant winter on the coast of British Columbia from the Queen Charlotte Islands to the southern end of Vancouver Island. The total Pacific population of about 150,000 regularly moves along our coast between the preferred wintering grounds of north-western Mexico and their northern nesting grounds. Beginning in late March large numbers of Black Brant are easily seen along the south coast, notably in Boundary Bay and along south-east Vancouver Island from Sooke to Campbell River.

DUCKS

Diving Ducks

Characteristics: The coloured wing patches of diving ducks lack the brilliance of the speculums of puddle ducks. Most diving ducks appear to be combinations of black and white. Many of them have short tails; their large paddle feet are used as rudders when flying. Diving ducks tend to run or patter along the water when taking off. They have a rapid wing beat when flying.

They dive to considerable depths to feed and can travel long distances under water. They emerge only their head before they submerge again.

Their diet consists of fish, shellfish, mollusks, and aquatic plants. Depending on their diet, some diving duck species have a fishy taste and are therefore not as popular as game.

Diving ducks include Canvasback, Redhead, Bufflehead, Greater and Lesser Scaup, Ring-necked Duck, Ruddy Duck, and Barrows and Common Goldeneye.

Sex Identification: Drakes "croak", "peep", and "growl"; hens have a mallard-like "quack". Drakes are more brightly coloured than hens, but eclipse drakes resemble hens.

Habitats: Diving ducks frequent the larger, deeper lakes, marshes, and rivers, and coastal bays and inlets.

Diving Duck Characteristics

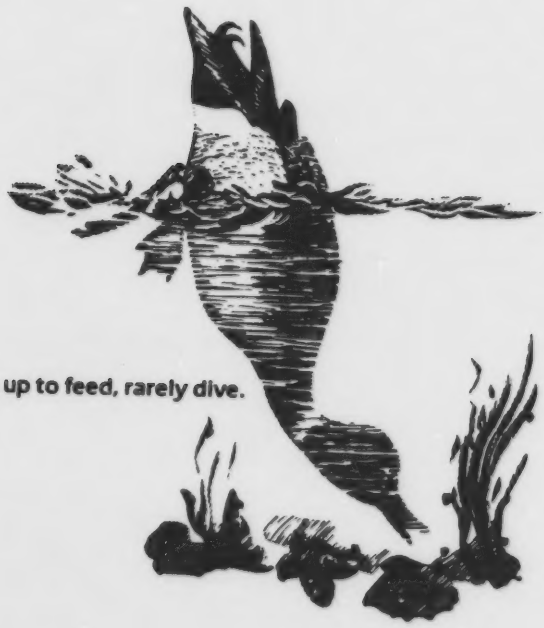
Patter along surface for some distance to take-off.

Dive completely underwater to feed.

Hind toe lobed.

Puddle Duck Characteristics

Spring into air on take-off.



Tip up to feed, rarely dive.

Puddle Ducks or Dabbling Ducks

Characteristics: Puddle ducks feed by dabbling with their bills on the surface or by tipping to grasp food in shallow water. They may also feed in fields. Their diet is mainly vegetable matter and grains. Therefore, their flesh is tasty, and they are popular as game.

The speculum, or coloured wing patch, is often iridescent and bright. This is often a telltale field mark.

They may fly in formation like geese. Puddle ducks generally have longer wings and neck and fly with a slower wing beat than divers. They take off from and land directly on the water's surface.

Puddle ducks include the Mallard, Pintail, Widgeon or Baldpate, Shoveller, Gadwall, Wood Duck, and the Green-winged, Blue-winged, and Cinnamon Teal.

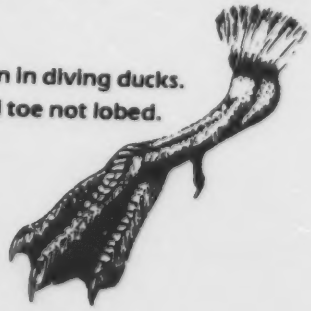
Sex Identification: The drake is more brightly coloured than the hen; drakes in early autumn in eclipse plummage, are often similar in colour to hens.

Habitats: They typically live in fresh water, shallow marshes and rivers rather than large lakes and bays.

Special Notes: Many waterbirds such as loons, grebes, cormorants, and alcids resemble ducks while on the water or in flight. Be certain of your identification.

For more details on the various species of ducks found in British Columbia, see the species identification pages later on this chapter.

Smaller foot than in diving ducks.
Hind toe not lobed.



Diving Duck Characteristics

Usually swim with tail close to water.

Puddle Duck Characteristics

Generally have metallic speculum.

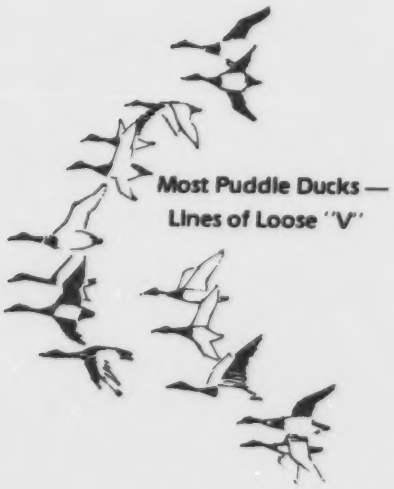
Usually swim with tail held clear of water.

Legs set near rear of body.

Legs near center of body.

Typical Flock Formations

Diving Ducks —
Loose Formation



Most Puddle Ducks —
Lines of Loose "V"

PINTAIL ("Sprigtail")

Male—the thin white (front) and brown (back) neck and long, pointed tail are distinctive. The wing patch (Speculum) is metallic bronze-green with a buff coloured bar above and white below. Their call is a short, mellow whistle, mewing notes (courtship) or loud "quaw quaw" (alarm). Female—typically buff-brown and spotted and streaked with darker markings. Like the male the body is generally slim but the Speculum is dull brown with little or no green. Their call is a hoarse, muffled quack. This bird nests throughout grassland areas of British Columbia on dry land often some distance from water. A few birds have been recorded nesting on the coast in the Fraser Valley. Very few pintail winter in British Columbia but large numbers of birds from Alaska, the Yukon and Northwest Territories concentrate on interior potholes and on coastal marshes, while enroute to main wintering areas along the coast of the United States, Mexico and northern South America.

BLUE-WINGED TEAL

Male—small dark coloured duck with a noticeable white crescent in front of its eye and a large "chalk-blue" patch on its upper wing. The green speculum is separated from the blue patch by a white bar. Their call is a series of chirping, cricket-like whistles. Female—mottled dark brown with a more buff coloured breast. Their wings are like the male's except they tend to be less vividly coloured. Their voice is a faint quack. They nest on dry land in grassy cover near marshes and willow borders throughout British Columbia but they are most common in parkland and grassland areas. Large concentrations are not common in British Columbia and most birds migrate in the early fall to wintering areas in the southern United States, Mexico and South America to Central Chile and Brazil.

GREEN-WINGED TEAL

Male—This is the smallest dark brown duck in North America and it has a distinctive vertical white bar separating the spotted buff breast from the grey sides. The head is dark reddish-brown with a dark green patch extending from the eye to the nape of the neck. The speculum is a bright metallic green bordered by black on the sides and buff brown above. Their call is a short mellow whistle. Female—mottled dark brown with wing colouration like the male but more subdued. Their call is a high pitched "quack". Nests on dry land in grass and under shrubs throughout British Columbia but they are most common in the central interior. In fall large numbers of this species congregate for several weeks in south interior marshes and in still larger numbers along coastal marshes. A few birds winter in British Columbia along the coast and in the south interior; most migrate to their main wintering areas in the southern United States to Central Mexico.

CINNAMON TEAL

Male—much like blue-winged teal except the head and body is rusty brown. Their call is a low, reedy rattle. Female—almost identical to the blue-winged teal except for a slightly wider and longer bill. Nests in grassy or shrubby areas on southern Vancouver Island, the Fraser Valley and through south interior grasslands and parklands. Their call is a soft quack. These birds occur in small numbers and migrate from British Columbia by late fall to their wintering grounds in the extreme southwest United States, Central America and South America to Colombia and Venezuela.

MALLARD ("Greenhead")

Male—This duck is distinctively coloured with yellow bill, orange-red feet, green head, red-brown breast, greyish back and belly, and dark green tail with several short upcurled centre feathers. The speculum is metallic purple-blue bordered above and below by white bars. Their call is a low, reedy squeek or a guttural chatter. Female—brown, dark streaked bird with buffy coloured chin and throat, dull-orange bill with black blotches and orange feet. Their call is a loud quack. The Mallard nests in grass, under shrubs, in marsh, in abandoned hawk nests near water and in tree cavities or stumps throughout British Columbia. It is a particularly common nesting bird in the southern interior and during migration it is one of the most common and abundant ducks, concentrating in large numbers along coastal marshes and valley marshes of the southern interior. Many Mallards winter on the coast and in the interior of British Columbia where food and water are available but some migrate to wintering grounds throughout the western United States and to Southern Mexico.

AMERICAN WIDGEON ("Baldpate")

Male—generally "greyish" with brown sides but with a distinctive yellow-white crown; dark green mask through the eyes; bluish bill; bold white shoulder patches on the upper wing; and metallic green and black speculum. Their call is a distinctive three note flute whistle with the middle note much higher than the first or last notes. Female—a brownish-grey bird with wing colours much more subdued than the male's. Their call is a harsh, squawking quack repeated often. Widgeon nest in grassy vegetation throughout grassland and parkland areas of British Columbia but a few have been found on the coast and in northern forest areas. Many nest in Alaska, the Yukon and the Northwest Territories. Flocks of widgeon migrate through interior valleys and along coastal marshes. Large numbers of widgeon winter along the coastal marshes of British Columbia particularly where agricultural lands are nearby. Many birds winter as far south as California.

WOOD DUCK

Male—this is the most intricately and multi-coloured of our ducks with a green with white crest; body colours of metallic green, blue, and bronze; white chin and belly; and reddish bronze chest with white spots. Wings are dark metallic blue with white lower edges. Their call is generally a long series of squeaky whistles with periodic cheep-cheep notes and clucks. Female—a brown-greenish duck with a white belly, chin and distinctive eyestrip. Wings are like that of the male except somewhat more subdued. Their call is a sharp, scraping quack (alarm) or a mellow, plaintive peep, peep. This bird is confined to south coastal and south interior marshlands, oxbows and river channels of British Columbia and marshlands of Washington, Oregon and California where suitable nesting cavities exist. It is not an abundant or common bird in British Columbia, except where artificial nesting boxes have been provided along southeastern Vancouver Island and in the lower Fraser Valley. A few birds winter in south coast marshes of British Columbia, but most winter in the United States south to California.

GADWALL ("Grey Duck")

Male—A generally grey duck with a distinctive black "rump" and white belly. It is the only puddle duck with a major part of its speculum coloured white, grey and black and with a prominent patch of rusty-brown on the upper wing. Its call is of three distinct types: a reed-like "wank", a short whistle, and a loud, short quack. Female— Like the male except with more brown than grey and with less prominent colouration on the wings. Nests in tall grass or under shrubs near water on the coast and in the southern interior of British Columbia. This bird also nests in the southwest prairies and in the northwest United States. It is not a common duck in British Columbia except on the outer portion of the Fraser Delta. Migrants occur on coastal and south interior marshes. A few gadwall remain to winter in the lower Fraser Valley but most migrate to California and southern Mexico.

LESSER SCAUP ("Blue-bill")

Male—It has a bluish bill; black-purplish head, chest, shoulders and rump; and white back and belly. It is like the Greater Scaup except the white on the lower edge of the wings does not extend beyond the bend or "wrist" towards the tip. Their call, particularly during flight, is a "purr purr" but they emit a loud "scaup scaup" when startled or a low, mellow whistle during courtship. Female—Like the Greater Scaup, a brown bird with a bluish bill, white face and white belly. Its wings are like the male's. Their call is a rattling, guttural "yaow-w-w-w". The Lesser Scaup nests in grass and in shorebery on land near marshes or open water throughout British Columbia except on the coast and in coast mountains. Large numbers of Lesser Scaup from British Columbia, Alaska, the Yukon and the Northwest Territories, migrate through the south interior of British Columbia and along coastal marshes. Many winter along the coast of British Columbia, the United States and south to Panama.

COMMON GOLDENEYE ("Whistler")

Male—A stout diver with greenish-black head; white shoulders and breast; and generally black back and tail. There is a distinctive white spot in front of and below the yellow or gold coloured eye. Wings have pronounced white patches which extend from the lower edge to the centre. The wings make a distinctive whistling noise, particularly when the birds are just taking off. Their voice is a sharp, loud "zhur zhur" but generally they are silent. Female—Its brown head and distinctly bordered white neck are useful in separating this bird from all but the female Barrows Goldeneye. It has a white belly and generally brown-grey back and tail and the wings have much less white than those of the male. Their voice is a low toned sharp "corrow" or a harsh, low "quaack". This bird nests in tree cavities or similar excavations, mainly east of the Rockies in the Peace River country but a few nest in the Cariboo and the Okanagan. Main nesting areas include Alaska, and the forests of Canada east to the Maritimes. Migrant birds are commonly seen through the interior and along the coast of British Columbia. The Common Goldeneye is a common wintering bird in coastal marshes from Alaska to California.

SHOVELLER ("Spoonbill")

Male—A colourful medium sized "dabbler" which at first glance looks like the mallard with green head; white breast and shoulders; brown sides and belly; black-green rump; and orange feet. It has a distinctive bluish, broad tipped bill and wings like a blue-winged or cinnamon teal with green speculum and cloth blue upper wing patch. Its call is a low, guttural "woo-woo-woo" or "tuc-tuc-tuc", although it often remains silent. Female—Its body is brown with a buff chin and white tail. It has a brown bill and wings coloured much like the males. Its voice is a faint, low quack. The Shoveller nests on the ground in thick cover near shallow water and marsh throughout British Columbia, except on the Coast and in the Coastal Mountains. A few birds do nest in the Fraser Valley. They also nest in Alaska and western Canada and the West Central United States, west of the Great Lakes. During migration this bird is commonly seen in the interior, the Fraser Valley and southern Vancouver Island in British Columbia. Most birds winter from Oregon south to southern Mexico.

BARROWS GOLDENEYE ("Whistler")

Male—A stout "diver" with a purplish-black head; a white crescent below and in front of its yellow or gold eye; white shoulders, chest and belly; and black back, rump and tail. Its wings are black except for a large white patch which extends from the lower edge to the centre. Like the Common Goldeneye the Barrows Goldeneye has wing feathers which "whistle" during flight. Their voice is like that of the Common Goldeneye. Female—A brown headed duck with a clearly defined white neck and white shoulder, chest and belly. Its wings are more subdued but like the males. Their call is like that of the American Goldeneye. The Barrows Goldeneye nests in trees or similar cavities near water throughout British Columbia, particularly in the Cariboo parklands. It also nests from south central Alaska to south western Colorado. Migrant birds commonly occur in British Columbia in the southern interior and in coastal marshes. Wintering birds are uncommon but do occur on the coast from southern Alaska to Central California and inland from southern British Columbia to Colorado.

BUFFLEHEAD ("Butterball")

Male—A small white and black duck with a dark green head having a white crown-cheek patch extending upward from behind and below the eye. Their neck, shoulders, chest and most of their back is white while part of the back, the rump and tail are black. Wings are black except for a white patch which extends from the lower edge to the upper middle. Their call is a low, guttural roll or a weak squeak. Female—a dark brown duck with a white patch below and behind the eye, a white-grey breast and a small white patch on the lower edge of the wing. Their call is a hoarse quack or a "cuk-cuk-cuk" often repeated. The Bufflehead nests in trees or other cavities near water throughout British Columbia, except on the coast and in the coast mountains. They also nest in Alaska, the Yukon and Northwest Territories and east to Hudson's Bay. Migrating birds are common in the interior and along the coast. Birds winter along the coast of Alaska and British Columbia and throughout the coast and interior of the United States.

HARLEQUIN DUCK

("Totem-pole duck")

Male—A very colourful, dark, stout duck which is metallic blackish blue covered with black outlined white patches on the head, neck, chest, back and sides. Their sides are rust brown and their wings are metallic-blue and purple with a patch of white on the lower edge nearest the body. Their call is a mouse-like squeak or a hoarse "lead-lead" or "oi-oi-oi". Female—A dark brown duck with white patches on the forehead, below the eye and behind the eye. Their wings are dull brown with a faint purplish lower edge. Their voice is a loud "ech-ech-ech" or "jeek-jeek". The Harlequin nests on the ground under thick shrubby cover, in trees and on cliffs near mountain streams throughout British Columbia excepting the Peace River area. They also nest along mountain streams in Alaska, the Yukon, Northwest Territories and in the northwest United States. Migrating birds are seldom seen inland except during the early spring but by midsummer non-breeding birds are commonly seen near kelp beds on the coastal wintering areas from Alaska to Southern California.

RUDDY DUCK ("Ruddy" or "Bluebill")

Male—This small duck has a distinctive black crown; blue bill; white face below the eye; and rust-red body. Their wings and tail are drab brown. Their call is loud "chuc-chuc-chuc-chucar" or "ick-ick-ick-ick-a-chuck" or "quo-ack". Female—A medium brown bird with a light grey belly and white lower face with a dark, horizontal stripe below the eye. Their call is a lair "quack" but they are most often silent. They nest over water on a floating nest in the interior grasslands and in the outer Fraser Valley of British Columbia. Migrant birds are seen in the southern interior and in the Fraser Valley. A few "Ruddys" winter on the South Coast of British Columbia, but most migrate to wintering grounds along the coast of the United States south to Central and Coastal Mexico.

WHITE-WINGED SCOTER ("Sea Duck")

Male—An all black, large duck with a yellow bill, having a black knob on the upper base; a small white loop extending behind the eye; and a distinctive white patch on the lower edge of the wing. Their call is a faint, hollow whistle, in a series of short notes but they are most often silent. Female—An all brown duck with white dots below and in front of the eye and below and behind the eye. Their wings are like the male's except brownish instead of black. They are generally silent but faint calls are like the male's. The white-winged Scoter nests on the ground on rocks, and among shrubs around marshes or lakes from the Yukon and Western Northwest Territories to Northern Montana and North Dakota. Nesting birds occur throughout interior parkland and grassland areas of British Columbia. Migrant birds are seen on the coast and in the south and central interior of British Columbia but most are seen as winter visitors on the coast from Alaska to Northern Mexico.

CANVASBACK ("Can")

Male—Its large rust-red head with sloping forehead and bill is distinctive and, as the name implies, it has a canvas-grey coloured back which is accentuated by its black shoulders, chest, and rump. Wings are generally grey with canvas-grey near the upper edge. Its call is a harsh, guttural creak or a peeping note. Female—It is like the male except it is coloured brown with a small wash of grey to the back and upper wings. Its call is a loud quack or a wailing "currow". It nests over water on floating vegetation or on dry land in the grassland and parkland areas of British Columbia. It nests throughout the prairies, the southwest and northwest territories and the northern United States. It is not a common bird in British Columbia and flocks of more than ten birds are seldom seen. Migrating birds are commonly seen on southern interior and on coastal marshes. A few birds regularly winter near Victoria and in the Fraser Valley but most winter in the southern United States and to Central Mexico.

GREATER SCAUP ("Blue-bill")

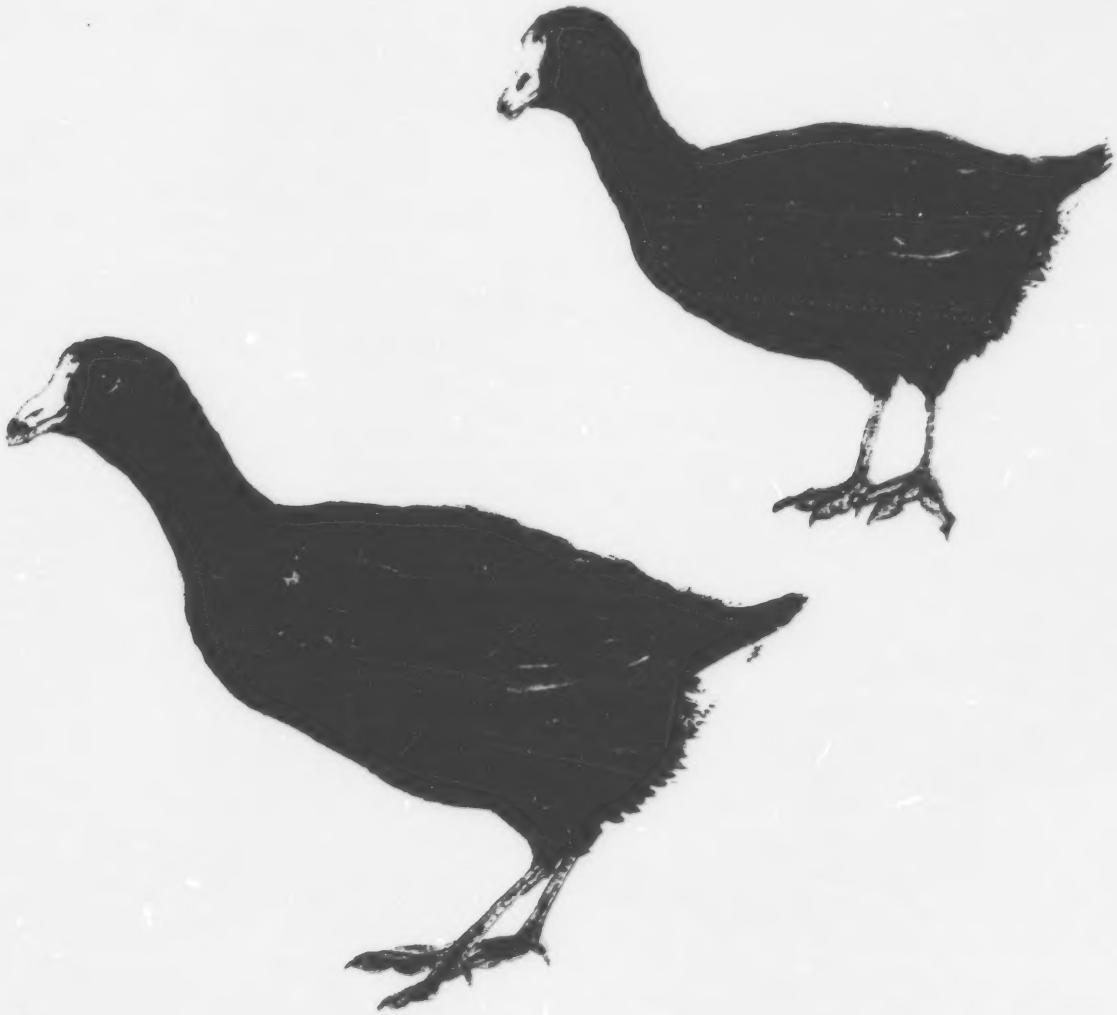
Male—Its dark metallic green head, black shoulder and chest and grayish back separate this bird from all North American ducks except the lesser Scaup. Wings are brownish grey except for a white lower edge which extends beyond the bend or "wrist" towards the tip. Their call is a loud "scaup scaup" or in courtship a soft, mooning "pahoo". Female—A brown duck with white belly and face and a dull blue bill. Wings are coloured like those of the male. Their call is a loud "cheep cheep" or "tuck-tuck-tur-a-tuck". Greater Scaup nest on the ground near water in Alaska, the Yukon and Northwest Territories and in the extreme north of British Columbia. Migrants occur throughout British Columbia and many remain to winter in coastal and south interior marshes where food and water area available. Most Greater Scaup winter on the coast from Alaska to Northern Mexico.

REDHEAD ("Blue-bill")

Male—A large duck with a distinctive high forehead; bluish bill; rusty-red head and neck; black upper back and chest; dark grey back and white belly. Wings are a dull brownish with a grey patch on the lower edge. Their call is a meowing cat-like call or a guttural purr. Female—A non-distinctive brown duck with whitish belly. Wings are like those of the male but without much grey on the upper edge. Their call is a loud, sharp squawk-like quack or a distinctive growling "r-r-rha". The Redhead nests over water or on dry land throughout the prairies of Canada, mid and northwestern United States and in the south and west of the grassland and parkland areas of British Columbia. This species is not abundant in British Columbia but it occurs as a migrant throughout the valleys of the south Interior and in the lower Fraser Valley. A few birds remain to winter near Vancouver but most migrate south to lower California and the Valley of Mexico.

RING-NECKED DUCK ("Blue-bill")

Male—Black-purplish head, chest and back (green near the tail) and white belly distinguish this bird from other divers. The bluish bill has two distinctive white rings; one near the tip and the other at the base. Wings are brownish-green with a grey patch on the lower edge. Their call is like that of the lesser Scaup. Female—A brown duck with whitish face, white belly and bluish bill. Wings are like those of the male but without much green. Their call is like that of the lesser Scaup. This bird nests on open ground near water throughout the southern half of British Columbia, particularly on higher lakes. It also nests from the Peace Athabasca hills to the eastern seaboard, south to the Great Lakes. It occurs in small flocks on migration in south interior valleys of British Columbia and along the south coastal marshes. A few birds winter on south coastal marshes and in isolated south interior areas where food and water are available. Most birds winter in the southern United States and Central America.



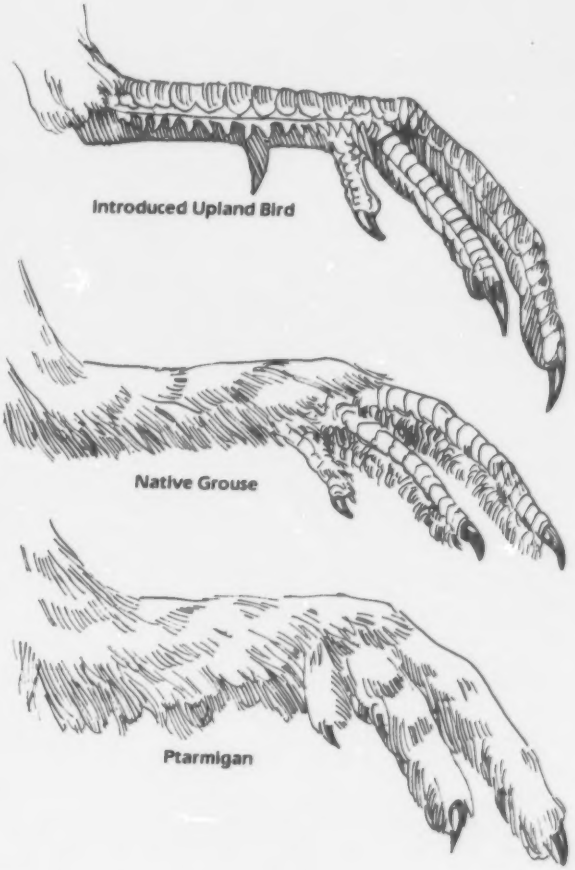
Coot

Characteristics: Though not a duck, the adult coot, commonly known as the "mudhen", is a grayish-black, duck-like bird. Adults have a black head and neck and weigh about 1 lb. (450 gm). The remaining portion of the body is slaty black. The toes have large scalloped webs on each side. Their white chicken-like bill and the pumping motion of their head and neck when swimming are distinctive features. Coots are often reluctant to fly and will run along the surface of the water for some distance. The trailing feet give this migratory bird a cumbersome appearance in flight. Some hunters find the flesh of this bird has a very strong flavour.

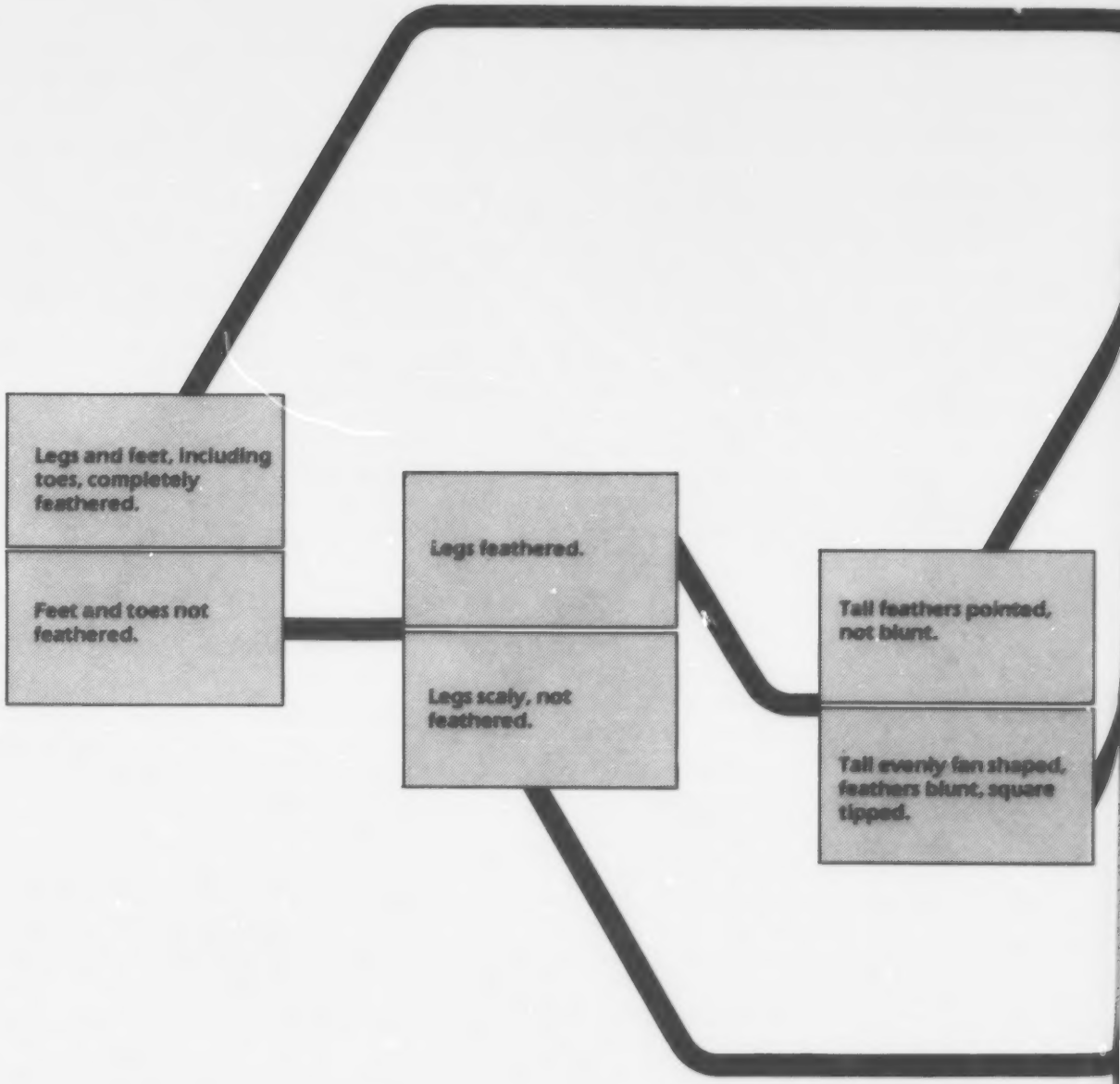
Distribution: The coot breeds in southern and central British Columbia, north to Vanderhoof and the Peace River district, and west to southern Vancouver Island.

UPLAND GAME BIRDS

This group includes the Gallinacious or chicken like birds (i.e. grouse, quail, partridge, ptarmigan, pheasant and turkey), the doves and the pigeons. The term "Upland" simply refers to where these birds are often found and pursued as game: other birds frequenting upland areas but which are not game are considered as individual species or under separate groups such as perching birds, more commonly termed "Dickie birds". Gallinaceous birds of several species and forms occur throughout British Columbia. The young of all these except the Ring-Necked Pheasant retain the pointed outer wing feathers through their first winter while adults have round tipped outer wing feathers. In general, Gallinaceous birds have short rounded wings adapted for short flights and strong legs well suited to running. They are very adept at hiding in cover. Grouse are subject to a poorly understood cyclic population fluctuation which can be very pronounced and occur over a period of years.



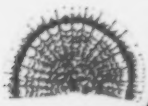
Upland Game Birds


Legs and feet, including toes, completely feathered.
Feet and toes not feathered.
Legs feathered.
Legs scaly, not feathered.
Tail feathers pointed, not blunt.
Tail evenly fan shaped, feathers blunt, square tipped.

Ptarmigan

Middle two tail feathers noticeably longer and darker than the rest of the tail.

Sharp-Tailed Grouse



Ruffed Grouse

Tail, when spread, shows a continuous wide dark band edged front and back with grey, prominent dark neck ruffs.

Tail feathers dark, tipped with rusty brown.

Spruce Grouse

Not as above.

Tail feathers dark, either entirely or with grey terminal band.

Blue Grouse

Center tail feathers long, barred and pointed.

Ring-Necked Pheasant

Smaller, greyish bird, short tail, brown feathers on breast.

Grey Partridge

Chukar Partridge

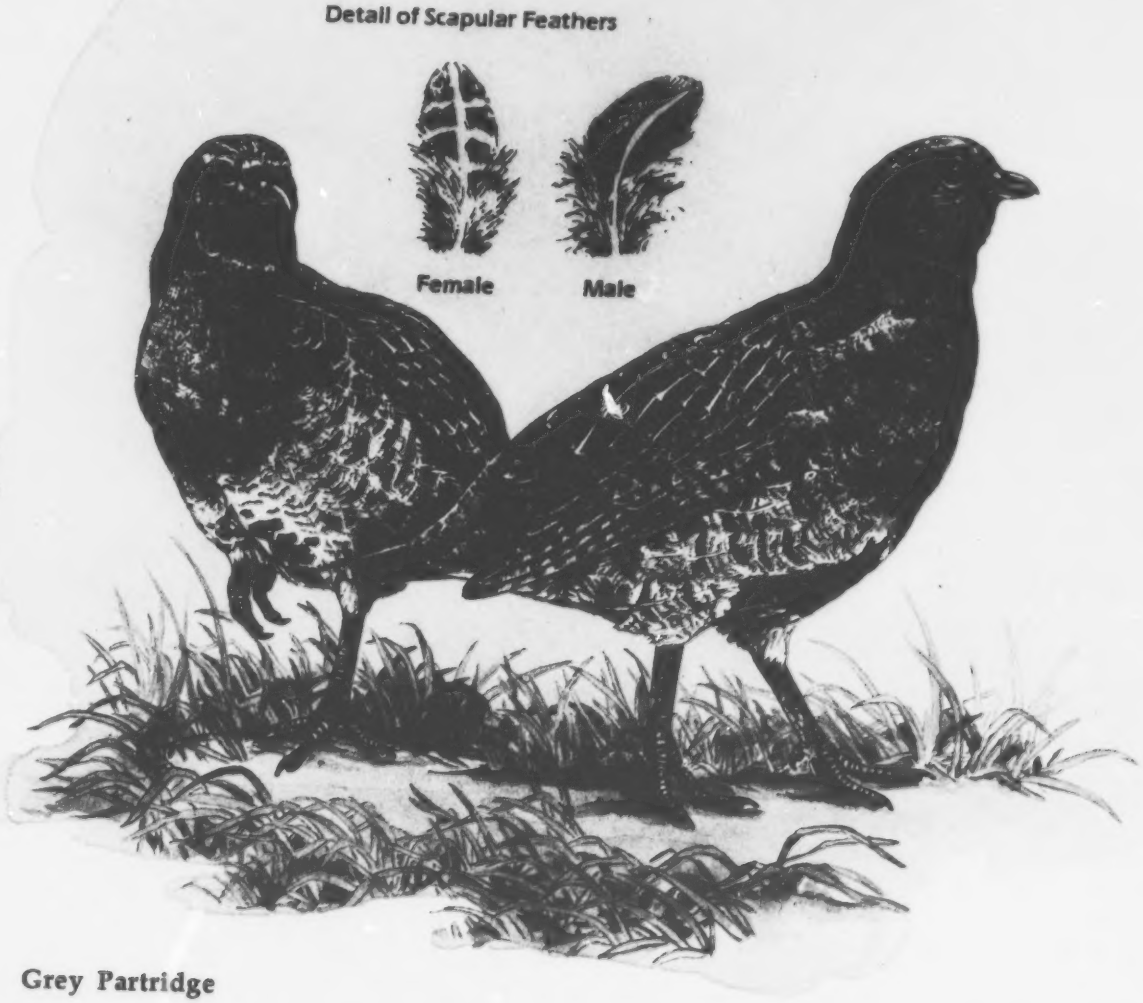
Characteristics: Chukar partridges are an introduced species. Their call is a loud "chukar" or an often repeated "chuck-chuck-chuck". They are very vocal, particularly when disturbed. They often run away, rather than flying.

They feed on a variety of plants and insects but tend to concentrate on buds and seeds, particularly in winter.

Sex Identification: Both sexes are coloured alike with a red beak and feet, buffy-white throat, grey wings, body and chest, black "v"-shaped bib, white belly, and white and black barred sides.

Habitats: They are a dry grasslands or desert bird and prefer steep, broken slopes. In winter they concentrate around river breaks, railways, and farmlands near available food supplies.

Distribution: Chukar Partridges are found in the Fraser Canyon, the Kamloops-Savona area, and the Okanagan.



Grey Partridge

Characteristics: Grey Partridges are an introduced species. They are a brownish-grey in colour with short brown tail feathers that are obvious and distinctive when viewed in flight.

They are often found in groups of 6 to 15 birds. When hunting you may see a group exploding from cover and flying in all directions. Occasionally they may escape by running through the stubble rather than taking flight.

In winter they burrow into snowdrifts for protection and survival.

Sex Identification: Male birds or cocks have a solid brown horseshoe marking on their lower breast. Hens and juveniles have a similar mark but it is broken and less distinct. Both hens and cocks weigh about 14 oz (400 gm).

Habitats: They are found in cultivated areas and grasslands where they feed on grain, grass seeds, and other vegetation.

Distribution: Found only in the dry grasslands of British Columbia's southern interior.

White-Tailed Ptarmigan

Characteristics: There are three species of ptarmigan in British Columbia All have white patches on the wings and heavy, feathered feet.

Ptarmigan are stout, short-tailed birds that are remarkably tame. They do not flush with a flurry when frightened.

They all have similar calls of "ca-out-ca-out", "kow-kow-kow", "do-ack", "kerr-ky-kerr" or a series of soft clucks and squeals.

In winter, ptarmigan plumage is almost completely white. In summer they are a mixture of blacks, browns, buff, and small amounts of white.

Sex Identification: Both sexes are coloured alike.

Habitats: All ptarmigan nest on the ground in open, rocky, subalpine or alpine areas. They are devoted parents.

Distribution: The distribution varies with each species, but generally they are found in subalpine, alpine, and northern areas.

Band-Tailed Pigeon

Characteristics: The name band-tailed is derived from the wide, pale gray band across the tail bordered with black. Band-tails are somewhat larger than pigeons and unlike them, are of a consistent colour and pattern. Band-tailed pigeons have slightly shorter wings and are lighter in weight than the domestic pigeon. They are blue-gray in colour with a white neck crescent above an irridescent nape. The yellow legs are a distinguishing characteristic.

Sex Identification: Both sexes are coloured alike with a black-tipped, bright yellow bill, yellow feet, yellow eye with red eye ring, brown-grey head, breast and wings, white belly, a small white bar across the upper neck, green metallic shoulders, grey rumps and grey tails with a distinctive broad band.

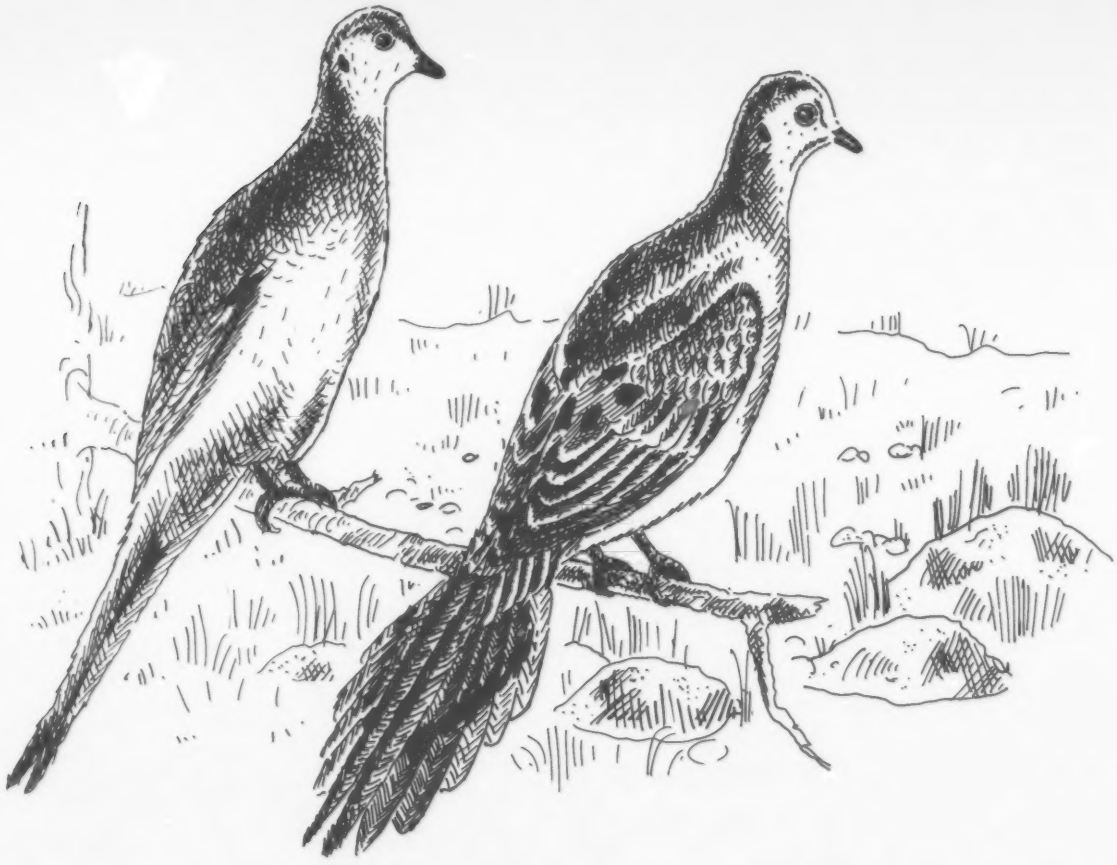
They make a low mellow "coo-coo" sound.

The breeding cycle ranges from mid-May to late August. The female lays one or two eggs per clutch, but may lay and hatch several clutches a year. Incubation requires 18 to 20 days.

Habitat: The habitat of the band-tailed pigeon is the conifer and oak forests of Western North America. It is a migratory bird and may form large flocks in later summer and early fall, wintering as far south as southern California.

This species feeds primarily on small seeds and berries.

Distribution: In the spring and summer they are found in British Columbia north to Prince Rupert, concentrating in the south-west of the coast range.



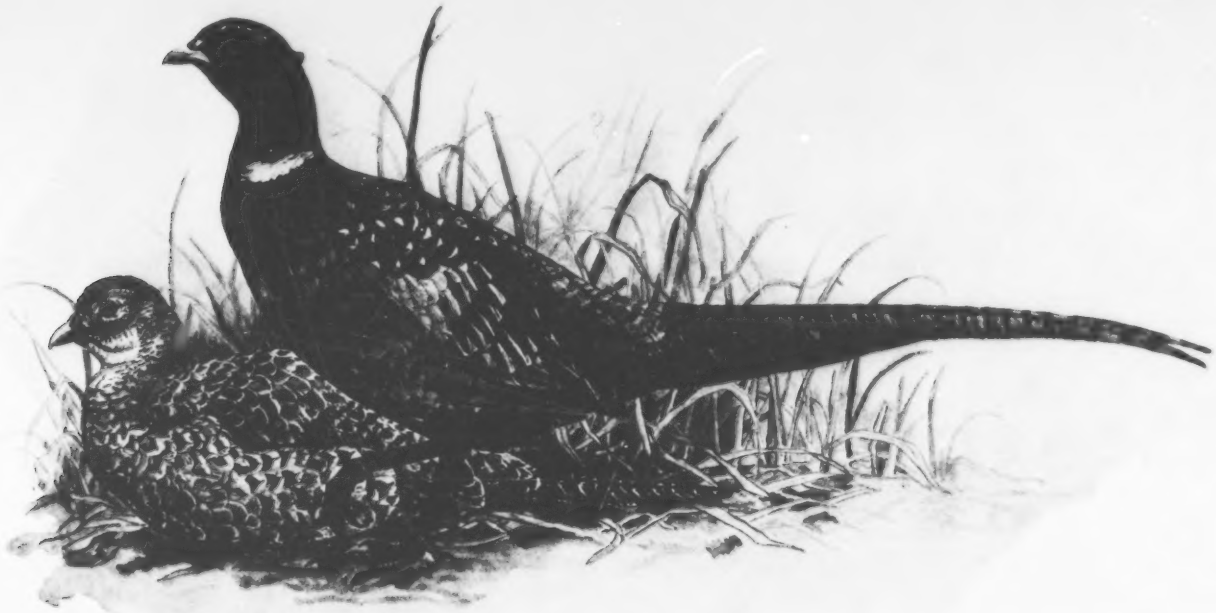
Mourning Dove

Characteristics: The mourning dove is a handsome, streamlined bird with a small head and long pointed tail which distinguishes it from all other Canadian doves and pigeons. Adult birds measure about 11 - 13 in (28 - 33 cm) in length.

Their plumage is slaty blue above and reddish fawn below, with large white spots on the tail. The mourning dove has a black spot behind the eye, a black bill, and the legs and the feet are red. Its flight is direct and rapid and its wings produce a noticeable whistle when the bird is in flight.

Habitats: This dove frequents woodland areas, farm fields and residential areas. It feeds primarily on small seeds and weeds.

Distribution: The mourning dove breeds north to Williams Lake in British Columbia and throughout the continental United States, southern Canada, and Mexico. Most British Columbia populations of mourning doves are migratory. In the fall, before flying south some flocks may wander north to the Yukon.



Ring-Necked Pheasant

Characteristics: Ring-Necked Pheasants are an excellent game bird. When flushed, they burst into the air with a flurry of wings often accompanied by loud "cock-cock-cock-cock" call. They may also run from an approaching hunter.

Their voice is a loud "screech", "squawk", "cock-cock-cock", or a screechy crow sound. They also produce a wide variety of "clucks" and "peeps" similar to chickens.

They eat a wide variety of plants, insects, and worms when available. During the winter in non-coastal areas their diet is mostly waste grain and other seeds and fruit.

Unlike grouse, pheasants will not burrow into snow drifts during the winter for protection. Without adequate dense cover they may die in winter.

Sex Identification: The male is a spectacularly colourful bird with dark green head, red eye, and red flesh areas on the face, white neck ring, bronze- yellow lower neck, shoulders, chest, sides, and back with black or gold dots. The belly is black; the rump and upper wings are greenish-brown. They have a long brown tail with many irregular cross bars.

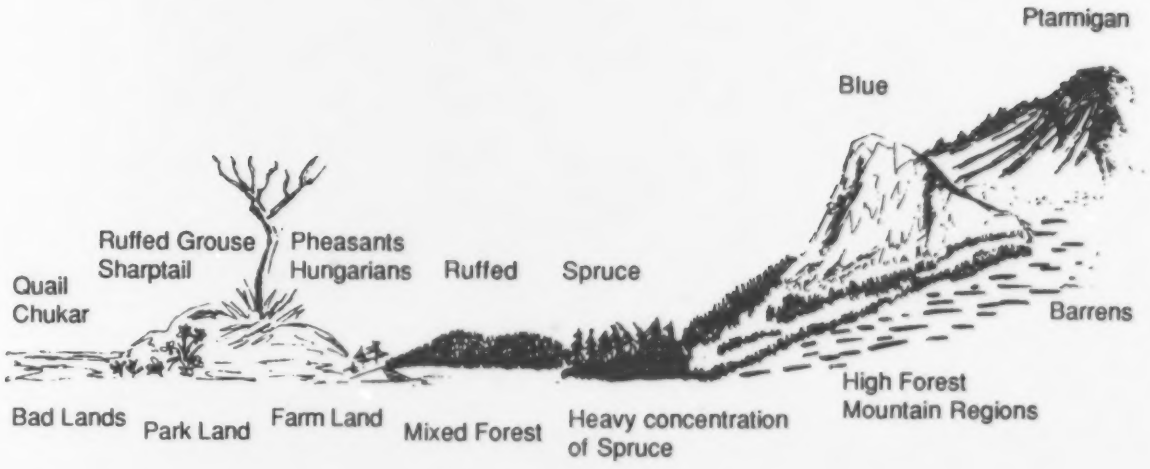
Hens are mottled brown and resemble the sharp-tailed grouse. Hens have a shorter tail than the cock.

Males or cocks have a particularly noticeable sharp spur on the lower rear inside of their legs which they use for fighting. Hens have smaller spurs.

Habitats: Their habitats include land under cultivation, rich soil, and suitable shrubby, hedgerow cover.

Distribution: They are found on south-east Vancouver Island, on most of the Gulf Islands, the Fraser Valley, the Fraser Canyon south of Dog Creek, the Kamloops area, the Okanagan, and the West Kootenays.

Grouse and Their Habitat (General)



Grouse

Characteristics: Grouse are generally a dull brown or grey colour. They feed on seeds and grasses and they may roost in trees. Grouse are small birds, with a round body and small head. They tend to have feathered legs and feet.

Sex Identification: There may be slight differences between the sexes.

Habitats: Generally found in or near coniferous forests. The Ruffed Grouse requires deciduous trees, while the Sharp-tailed Grouse favours grasslands or open meadows.

Distribution: Throughout the prc .ince.

There are four species: the Blue Grouse, Spruce Grouse, Ruffed Grouse, and Sharp-tailed Grouse.

Blue Grouse (Blues)

Technically these large birds are described as being of four subspecies in British Columbia, but generally two types are identified—the "sooty" of the coast and the "dusky" of the interior.

Males are mottled greyish-blue birds with brown wings, two yellow air sacs on the breast (seen when inflated) and a fleshy, yellow area over the eye: females are mottled brown all over. Males of the two types of blues commonly identified in British Columbia may be distinguished from each other by the presence of a grey tail band in the "sooty" and its absence in the "dusky".

The voice of the Blue Grouse is typically a subdued chicken-like series of clucks except during the spring mating season when males emit a loud "hooting" sound.

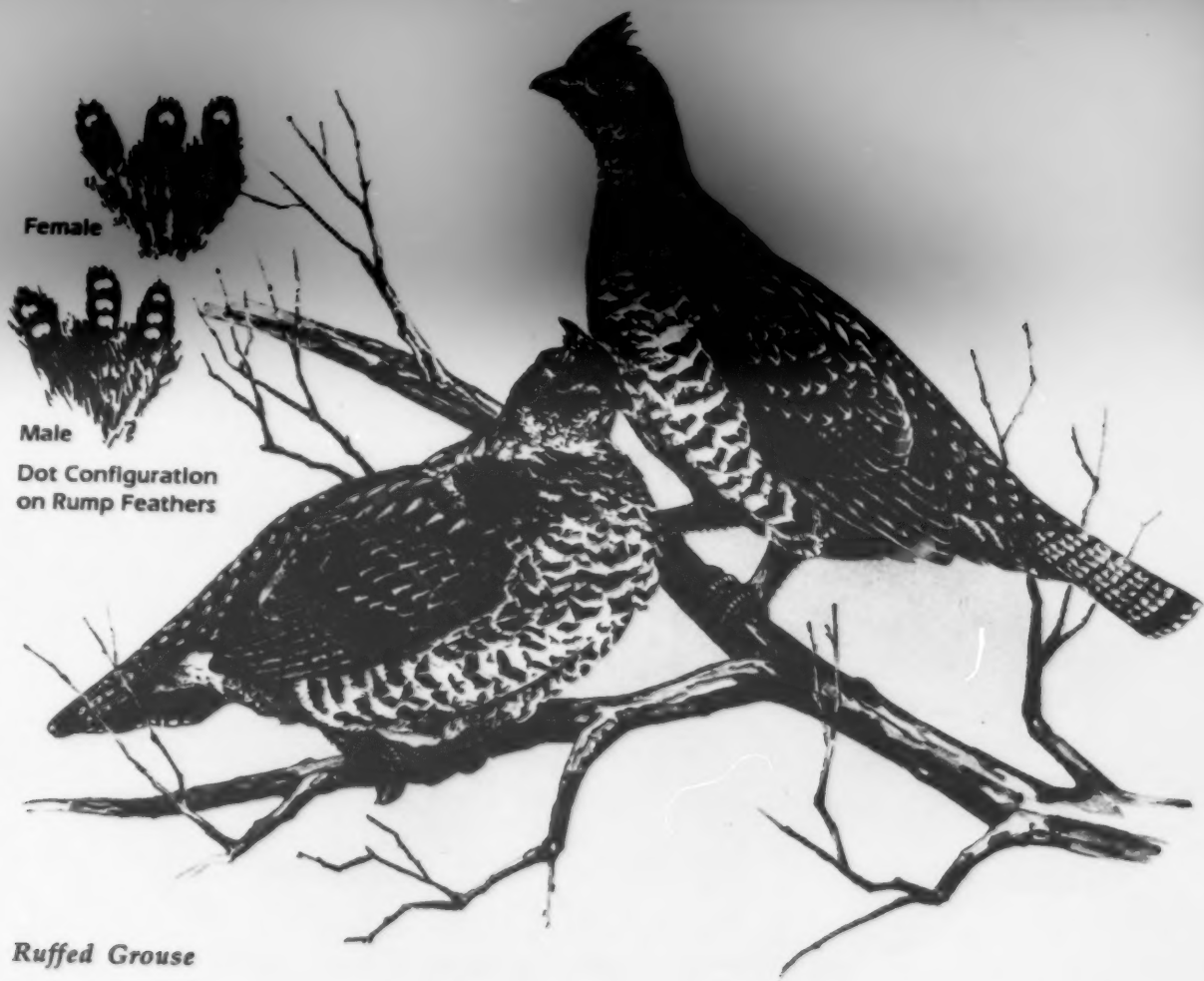
"Blues" nest in mixed grass-shrub vegetation at lower elevations but migrate to higher elevations for winter where they feed extensively on needles and buds of conifers. They show little fear of man while roosting in a tree, or while on the ground during the nesting period.

Spruce Grouse ("Fool Hen")

A medium sized grouse identified as being of two types in British Columbia—the Hudsonian and the Franklin's.

Males are generally black-grey birds with brown wings, white tipped feathers on the belly and under the tail and a reddish fleshy area over the eye. They may be distinguished by the presence of a rusty tail band in the Hudsonian and its absence in the Franklin's. Females are mottle brown and are difficult to distinguish from female blue grouse: however, spruce grouse generally have a more rusty tipped tail than do blue grouse. Spruce grouse nest and winter in dense coniferous forests throughout British Columbia with the exception of the coast and the coast range. They feed on a variety of plants and insects when available but confine their diet to buds and needles of conifers during the winter.

Their voice is commonly a series of "peeping clucks", but during courtship the males produce a low, gutteral whining series of notes. Spruce grouse often show little or no fear of man and may be easily approached: this has led to the name "Fool Hen". When flushed, the bird may fly to a nearby tree and roost in spite of considerable disturbance on the ground below it.



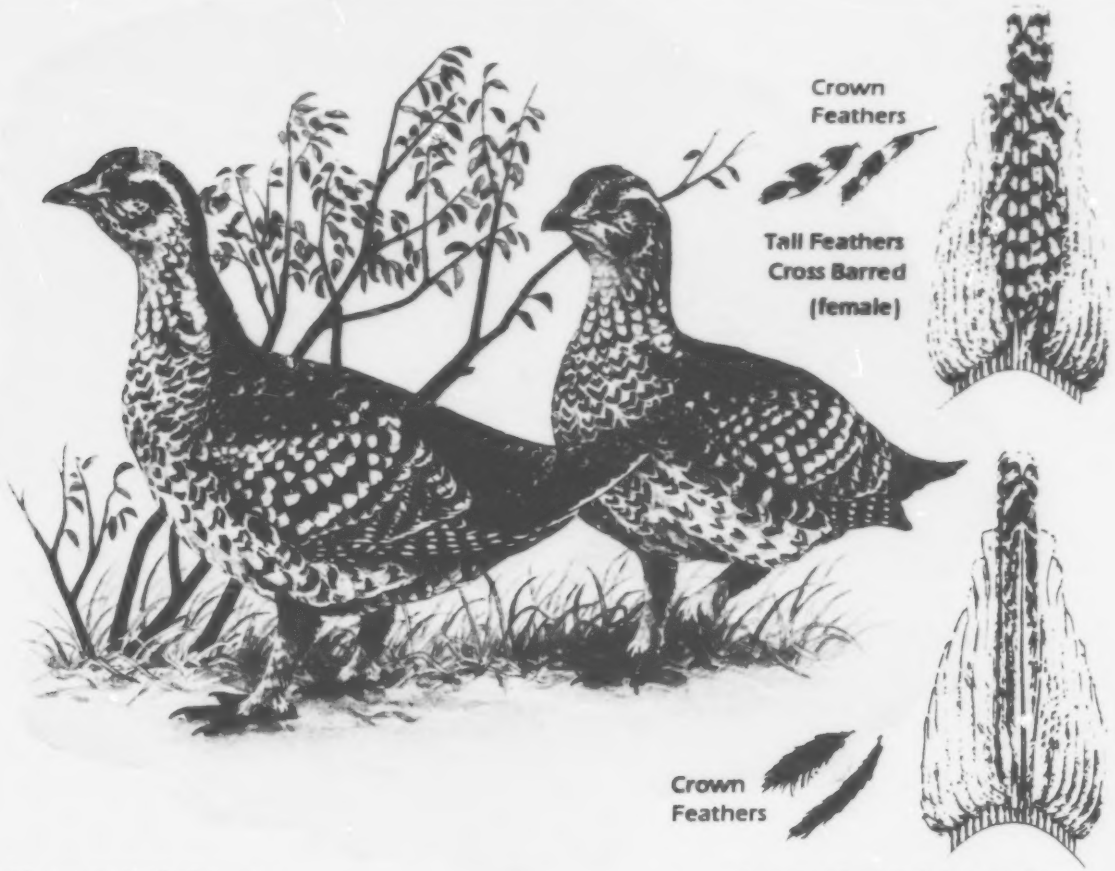
Ruffed Grouse

Ruffed Grouse are the most abundant and wide-spread grouse in British Columbia.

Both males and females can be either reddish or greyish mottle coloured, but they always have a fan-shaped tail with a number of parallel black bands across the lighter background, and a single wide black band near the tip. Both sexes have an erectable crest. The male has a prominent black "ruff" on each side of the neck. In the female the center two tail feathers lack the broad, black band near the tip.

Their call is a series of "squawks", "peeps" and "clucks" in both sexes. During courtship the male makes a "whump-whump-whump-pump-pump-pump" noise by rapidly vibrating its open wings, usually from atop a log. Ruffed Grouse occupy mixed forest and shrub areas throughout the province but they are most abundant in mixed, deciduous growth, thus the term "Willow Grouse".

Generally, Ruffed Grouse are wary birds and they usually flush with an explolsive burst of speed. Ruffed Grouse feed on a variety of plants and insects when available but they tend to confine their diet to seeds, buds and coniferous needles during winter.



Sharp-tailed Grouse

Sharp-tailed Grouse are not an abundant bird in British Columbia, except in the parklands of the Peace River region and the grasslands of the central and southern interior. Isolated populations do occur in the Kootenays and Prince George area and a few have been recorded near Atlin on the British Columbia-Yukon border.

Three sub-species have been described in British Columbia but they do not differ by features which are easily recognizable in the field.

Sharp-tails are light brown and buff with prominent white tips on their body feathers: they have pointed white-edged tails with dark bands on the brown centre feathers.

Both sexes have a small erectable crest. The male has a small yellow area over the eye and purplish sacs on either side of the neck which are inflated during courtship on the "dancing" ground. Dancing involves males only: they usually choose an open grassy, area and display by rapidly stamping their feet up and down, expanding their air sacs, fanning their tails vertically, and rapidly shaking their wings to create a rattling noise.

The voice is often a low, mellow "koot" or pigeon-like "coo-oo" but it may also be a series of low chicken-like "clucks" and squeals. When startled, sharp-tails burst from cover with a loud whir of wings, flying straight away and periodically "sailing".

Sharp-tails occur in mixed tree-shrub growth and open areas; they eat a variety of available plants and insects but during winter they concentrate on seeds, berries, and buds of deciduous trees or shrubs.

Common Snipe

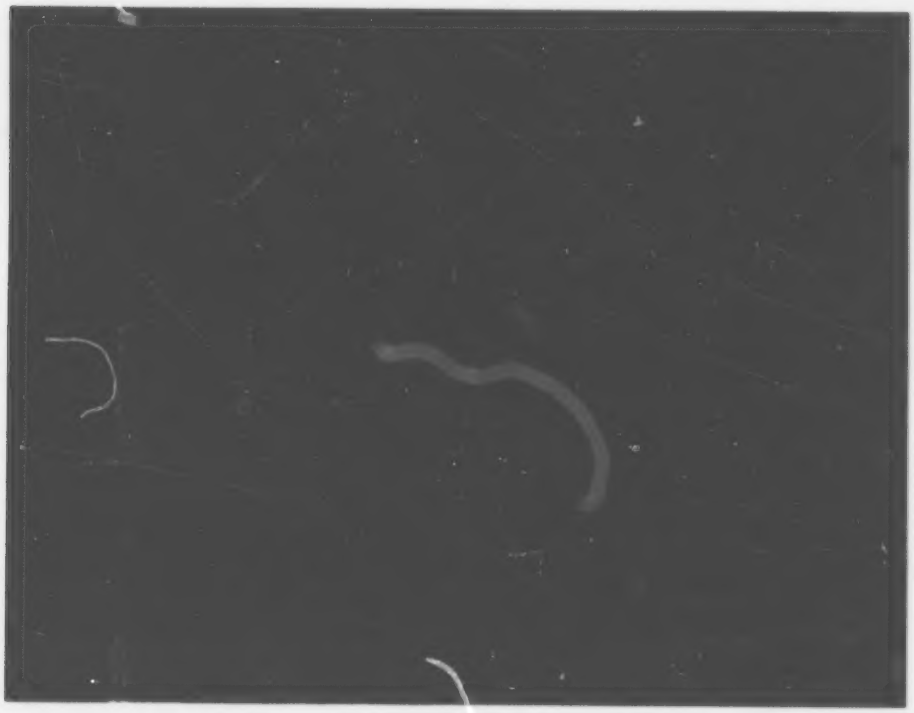
Characteristics: The Common Snipe reaches an average length of 10.4 - 11.6 inches (265 - 295 mm) including the bill. The bill is 2.5 inches (64 mm) long, flesh coloured, though darkening to a deep brown. An adult bird weighs between 2.5 - 5.5 ounces (70-155 gr.). The legs and feet are greenish-gray to yellow green. There are broad, blackish, sometimes flecked, crown stripes and also a dark stripe through the eyes and a dark patch on the lower cheek.

Breeding takes place in early spring. Clutches consist of four heavily blotched, buffy eggs. The incubation period for the eggs is 19 days.

Distribution: The snipe is a migratory bird. Found throughout British Columbia, its summer range extends across the central southern region of the United States up to the coast of Alaska. The snipe's winter range runs from southern British Columbia as far south as Brazil.

Habitat: Their diet consists mainly of animal matter; largely insects, earthworms, crustacea, spiders, and mollusks. Supplementary foods include plant matter such as seeds, fibres and grit.

Snipe tend to be solitary. Their main habitat areas are wetland areas, near bogs and swamps. Snipe can be easily confused with other long-billed shorebirds which cannot be hunted; for example, the curlew, sandpipers and dowitchers. Careful field identification is required.



Male California Quail

Mountain and California Quail

Characteristics: Quail are very gregarious birds and form large families and flocks, particularly in fall and winter.

When flushed, birds will fly in a flurry in all directions.

They have a three-noted call "qua-quer-yo", a soft peep, a low whistle, various clucks, and a loud "querk".

Quail eat a variety of available insects and plants. In winter they eat shoots, buds, fruit, and seeds.

Species Identification: Both species are short-necked and short-tailed brown and grey-blue birds with a distinctive top plume, forward-curving in the California Quail and straight in the Mountain Quail. Males have distinct facial patterns while females do not.

Habitats: They occupy dryland scrub and farmland hedgerows.

Distribution: California Quail are found on south east Vancouver Island, the Gulf Islands, and in the Okanagan while Mountain Quail are only found on Southeast Vancouver Island.

Special Notes: There is no open hunting season on Mountain Quail.

BIRD REVIEW

1. Define:

   plumage
   raptor
   speculum
   waterfowl

2. List three characteristics that can be used to identify a bird species.

3. Name three protected birds.

4. List three differences between puddle ducks and diving ducks.

RAPTORIAL BIRDS

Raptorial birds, hawks, owls and eagles, have been both persecuted and used by humans for thousands of years. To some, they are among the most noble of birds while to others they are killers that should be destroyed on sight. Falcons and other birds or prey were not protected in British Columbia until 1961, following extensive lobbying by falconers. Since that time, the severe declines in certain species such as the peregrine falcon have led to better management practices. All species are under the sole jurisdiction of the province and all are protected by the Wildlife Act.

The continued survival of raptorial birds in British Columbia is dependant upon the status of their prey species, the quality of their habitat, and the use of pesticides. The population of each species may increase or decrease as a result of shifts in prey species, destruction of nesting habitat, harassment of nesting birds, widespread persecution of birds, or chemical poisons passed on to the birds through their prey, which affects their reproduction.

Current management is limited to breeding surveys of selected species and restrictions on the capture of birds. Some particularly important prey species habitat and raptor nesting sites have also been protected.

Characteristics: In British Columbia there are eight species of hawks, five falcons, one harrier, two eagles, one osprey, one vulture, and fifteen species of owls. Raptorial birds are characterized by large talons and strong feet for grabbing and holding prey, and large strong beaks for tearing the prey apart. In one species, the Turkey Vulture, the feet are not strong as it feeds on dead animals. All other species, except the Osprey which captures fish and the Bald Eagle which kills and scavenges both fish and terrestrial vertebrates, feed on terrestrial animal species captured alive and subsequently killed.

The raptorial birds in British Columbia represent six families. They include the Turkey Vulture, a carrion eater, the Osprey, a fish eater, the bald Eagle; the Northern Harrier; the Northern Goshawk, Cooper's Hawk and Sharp-shinned Hawk, all truly predatory, especially on other birds; Swainson's Hawk, Red-tailed Hawk, Rough-legged Hawk, Brood-winged Hawk and Ferruginous Hawk; the Golden Eagle; and the American Kestrel, Merlin, Prairie Falcon, Peregrine Falcon, and Gyrfalcon.

The owls of British Columbia include the Common Barn Owl, the Western Screech-owl and Flamulated Owl; the Great Horned Owl; Snowy Owl; the Northern Hawk-owl; the Northern Pygmy-owl; the Burrowing Owl; the Barrel Owl, Spotted Owl and Great Gray Owl; the Long-eared Owl and the Short-eared Owl; the Northern Saw-whet Owl and the Boreal Owl.

The hawks, eagles and falcons are all daytime hunters. All species in British Columbia except the Turkey Vulture are characterized by the female being larger than the male. All are strong flyers. In most species the young do not obtain adult plumage until 2 years or older.

Members of the owl family are generally nocturnal hunters, although some species are active by day. Owls are characterized by a large facial disc with the eyes situated in the front looking straight ahead. The external ear opening is very large while the feathers are exceptionally soft for quiet flight. Some species migrate while others are resident in parts of British Columbia all year.

Raptorial birds nest in a variety of sites according to the species; in cavities in trees, ledges on cliffs, old abandoned nests of other species, in barns, and on the ground. Most hawks do not breed until at least two years of age, while eagles do not breed until 4 or 5 years of age.

Prairie Falcon

The raptors in British Columbia all lay more than one egg, varying from two (Turkey Vulture) to as many as eleven (Burrowing Owl). Incubation varies from 21 days (Burrowing Owl) to 45 days (Golden Eagle), with the larger species usually taking longer. In most species both sexes share in the incubation and care of the young. Incubation usually begins before all the eggs are laid, and as a consequence, the young hatch at different times.

The difference in the size of young often leads to only the largest ones surviving; especially when food is scarce. The time from hatching to flying varies from about four weeks in the case of the smaller species to up to about 80 days in the case of the Turkey Vulture.

In most species there is a high mortality of young in the first year. This is most often a result of starvation, due to their inability to capture enough food. In some species, even though they are protected, illegal shooting may be a serious cause of mortality.

Many of the species of hawks occurring in British Columbia have been bred successfully in captivity in recent years.

Since the early 1960's, declines have been observed in many parts of the world in raptorial bird species that feed primarily on other birds or fish. The declines have been attributed to pesticide contamination of the food species which becomes concentrated in the raptors and causes reproductive failures.

Habitats: Habitat for raptorial birds varies with the species. While some require wide open spaces like plains and deserts (Ferruginous Hawk), others are at home only in the boreal forest (Great Grey Owl). Others such as the Peregine Falcon have more general habitat requirements but must have a concentration of prey species nearby with plenty of airspace around to aid in hunting. Such conditions are most often found along sea coasts and river valleys.

Generally each species has requirements which vary slightly from those of other species. Nesting sites are a feature of habitat that may limit some species. Barn Owls, for example, normally nest in old wooden buildings; the gradual destruction of such structures on the Lower Mainland, and their replacement by bird-proof metal buildings has adversely affected their reproduction.

Many of the smaller raptors require cavities in trees for nesting. Those cavities are most often created by woodpeckers. Logging and clearing for agriculture are reducing the numbers of trees in which cavities are normally made and thus adversely affecting some species. Some raptors nest in mature or over mature-trees (Bald Eagle, Osprey), while others prefer cliffs (Peregrine Falcon, Prairie Falcon). Other raptors use the abandoned nests of crows and other larger birds (Merlin, Great Horned Owl). Some make nests which are very elaborate (Bald Eagle) and some (Peregrine Falcon) lay their eggs directly on the ground.

Distribution: Both hawks and owls are widely distributed in British Columbia. No geographic area is without at least one species. While some species are very restricted in range (eg., Spotted Owl, Barn Owl), others are distributed over most of the province (eg., Goshawk, Great Horned Owl). No systematic surveys have been carried out to determine the number of hawks and owls in British Columbia, with the exception of Peregrine Falcons nesting on the Queen Charlotte Islands and on some other coastal areas, and Bald Eagles nesting on the coast.

However, it can generally be stated that those species with specialized habitats or foods are less numerous than less specialized species. For example, among the falcons, the insect eating Kestrel is more common than the more specialized Merlin. Bald Eagles which both capture prey and eat carrion are more common than the Turkey Vulture which eats carrion only. Some Arctic nesting species (Gyrfalcon, Snowy Owl) are more common in British Columbia during winter than at other times. Their numbers vary but increase significantly in those years when food is in short supply in the north.

Raptors and Humans

Historically, humans used raptorial birds for several purposes. The feathers and claws of certain species were used for ceremonial purposes by native people, some species were captured alive and used for hunting (falconry) and a few people spent time observing and studying the birds. In recent years, interest in observing raptorial birds has increased. Only certain species are of use in falconry, a legal activity regulated by permit in British Columbia. Raptorial birds are useful to humans, especially in agricultural areas, because of the large number of rodents they destroy.

5

HUNTING LAWS AND REGULATIONS

Goal of the Chapter

To teach the student to use the Hunting Regulations Synopsis and understand its purposes.

Objectives of the Chapter

This chapter will teach you:

1. To use the current hunting regulations synopsis to determine:

- licensing information
- definitions
- what is unlawful
- provincial and regional bag and possession limits
- provincial and regional game species, seasons, hunting areas, and special, closed, and no shooting areas
- Observe, Record, and Report program
- appropriate evidence of species and sex

2. To relate some wildlife regulations to their purpose:

- Protection of people, property, and wildlife

INTRODUCTION

In our society, laws are defined as rules that regulate and control many areas of our lives by setting a minimum standard of behaviour. Laws are made by federal, provincial, and municipal governments, and cover areas that include criminal behaviour, business activities, vehicle use, education, and many others. Firearm use and hunting are also areas controlled by law. All three levels of government make laws which affect hunting.

The federal government deals with firearm use and misuse through the Criminal Code.

The provincial governments make laws concerning hunting within the province, and municipalities also make laws dealing with shooting within the municipality.

Laws can have two parts—a *statute* and *regulations*. A statute is an act or bill passed by a governing body. It requires a certain number of readings (usually three) and must be passed by a vote of the body during a regular sitting. It becomes a law after being signed by the Governor General (for federal) or Lieutenant Governor (for provincial).

This can be a slow process that may involve committees, public hearings, amendments, and other procedures.

A regulation is a law that is adopted or approved by the Governor in Council. It is specific to a statute that authorizes that a regulation on a certain issue may be made.

Regulations, because they are easier and quicker to create or change, usually deal with areas that need to be changed frequently, such as hunting seasons and bag limits, licence fees, and similar things.

Regulations are part of the law or statute under which they were created.

HUNTING LAWS

It is the responsibility of every hunter to know the federal, provincial, and municipal laws which apply to hunting in British Columbia. This does not mean that you have to memorize all the laws, but you do need to know and understand the laws that govern hunting, and where to find the ones that apply in your case.

The British Columbia Hunting and Trapping Regulations Synopsis is printed every year by the Ministry of Environment. Each year, hunters should pick up a free copy from a sporting goods store or Government Agents' office.

Read the synopsis carefully. Seasons, limits, and hunting areas may change from year to year. The synopsis will be discussed in detail later in this chapter.

The Criminal Code deals with laws concerning firearm possession and use. The RCMP and city police departments have pamphlets that outline the basic laws concerning firearm possession and use. Shooting organizations such as the Shooting Federation of Canada and the B.C. Federation of Shooting Sports can also provide information on this.

Municipal by-laws can be obtained from each municipality. The Ministry of Environment publishes the Fraser Valley Special Area brochure, which details provincial and municipal firearm regulations in the Fraser Valley.

ENFORCING LAWS

Agencies

Hunting laws are enforced through various government agencies. In British Columbia, Conservation Officers have the primary responsibility to enforce laws applying to

the enviroment. Other enforcement officers include the RCMP, forestry and parks officers, and other persons who may be appointed.

If you are caught breaking a hunting or firearm law you may be warned of your offence or charged under a specific law.

If you are warned it may be because the offence was not very serious, you made a mistake, or no real damage was caused. A warning serves to make you aware of the law, and the correct procedure for future use.

A *charge* is an accusation in legal terms. If you are charged with breaking the law, one of three things will happen. You may be issued a ticket that asks you to make a voluntary fine payment. You may be advised of a date that you must appear in court, or you may be taken into custody. You may also have property seized in any of these three situations.

If you are charged with an offence you may plead guilty and be sentenced. If you plead not guilty, you will have a trial at which time the prosecuting lawyer will introduce the evidence of the officer who charged you, as well as any other witnesses and evidence. You will be allowed to introduce any evidence and witnesses you have on your own behalf. The judge will listen to both sides and make a finding of guilty or not guilty.

If you are found guilty or plead guilty, you will be sentenced to a fine or imprisonment depending on the offence. You may also be subject to forfeiture of property such as firearms, vehicles and game. You may lose your right to hunt and to possess a firearm. Because of the seriousness of the consequences you should consult a lawyer if you are charged with an offence.

PURPOSE OF HUNTING LAWS

Laws are made for the benefit and protection of the people they serve. Hunting laws serve hunters and non-hunters alike. They generally fall into one of three categories: protection of people, property, and wildlife.

Safety and Protection

Safety is an essential part of outdoor recreation. Where there are situations of obvious danger as with the use of firearms, laws are set to prevent endangering sportsmen or the people they may come in contact with.

Laws to Protect Life

The benefit of years of experience with gun handling is built into firearms and hunting laws. Each restriction is the result of a safety problem that has been found in particular situations. For example, laws prohibit:

1. the carrying of loaded firearms in a vehicle;

2. the discharge of firearms under conditions where visibility makes it unsafe to do so;

3. pointing a firearm, whether loaded or unloaded, at another person;

4. the unsafe handling, carrying, or storage of firearms.

Experience has shown that these practices have produced unnecessary risk to hunters and other people.

Laws to Protect Property

Other activities may be damaging to property if not to human life. The privilege of movement over private property carries with it a responsibility for the sportsman to respect the rights of the landowner, and

this is supported by law. For example, it is unlawful:

1. to hunt or trap in enclosed land or private property without the owner's permission;

2. to damage, or allow a dog to damage, any seeded or planted area;

3. to discharge, dump, discard, or dispose of litter on any land or fresh water;

4. to deface any notice posted under authority of the Wildlife Act.

Laws to Protect Wildlife

Most wildlife is protected by law. These laws and regulations are usually of two types: those that directly protect wildlife and those that protect wildlife habitat. Game animals for which hunting is allowed are protected in many ways, including restrictions as to hunting methods or season, number, location and the sex or age at which the game animal may be hunted.

Wildlife conservation and management is discussed in more detail in Chapter 8.

General Information Applying to All of British Columbia

General laws, listed at the beginning of the Hunting Synopsis, apply province-wide. Make sure you read and clearly understand them. These laws are for your safety and the continued conservation of wildlife. Failure to comply with any of these laws could result in a fine or loss of your hunting privileges.

Promotion of Sportsmanship

To qualify as an outdoor sport, hunting must include terms which prevent the hunter from having an excessively unfair advantage over his quarry. Over the years, sportsmen have developed their own code of hunting behaviour which includes a respect for the game they hunt.

To apply this code to modern management, laws and regulations have been set which prohibit any hunting methods which allow the taking of improper numbers or kinds of game.

The concept of "fair chase" is the basis for many of these laws and regulations. What this means is that the hunter must not resort to artificial means of chasing or luring animals into a situation where they are easily taken.

Some of these laws prohibit:

1. the discharge of firearms from an automobile, snowmobile, boat, or other vehicle on or off a highway;

2. hunting game from any aircraft, or hunting or transporting hunters or wildlife by helicopter;

3. having possession of, placing, or setting poison for the taking of any game;

4. using pit lamps or lights of any description at any time for the purpose of hunting game;

5. hunting black or grizzly bear by placing bait;

6. hunting, taking, wounding, or killing big game while it is swimming unless it has been previously wounded.

Harvest Distribution and Aesthetic Enjoyment

Every person has an equal right to the enjoyment and benefits of the natural resources and wildlife of the province. The responsibility for the protection and

management of this resource lies with the government, in particular the Fish and Wildlife Branch of the Ministry of Environment. It makes laws and regulations to ensure that everyone has a continuing opportunity to use and appreciate wildlife.

The Wildlife Act, the Migratory Birds Act and the Fisheries Act are regulations that protect and conserve wildlife. These acts are available in law libraries, some public libraries, and from government agencies and bookstores that sell government publications.

Accidental Violations

Accidents can happen. If you shoot an animal not in season, or a domestic animal, report it to the authorities or land owner at your first opportunity.

You may be liable to pay for a domestic animal even if it was an accident. Whether you are charged for a hunting violation will depend on the circumstances of the incident.

Failing to report an accident will *always* result in more serious consequences if discovered.

Legal Responsibility

Ignorance of existing laws is not an acceptable defence in a court of law. If a person plays hockey and breaks a rule of the game, he is penalized. Likewise, he is expected to know the rules of the game and to abide by them. The same thing applies to hunting. If a person decides to hunt, he is expected to know the laws governing hunting and must obey them.

Public Responsibility

The public has a responsibility to report law breakers. A program called *"Observe, Record, Report"* sets out guidelines to help you report persons who violate hunting laws. Under this program you cannot make a "citizen's arrest" and should not confront a violator. However, you can use the guidelines to report them.

Observe

Familiarize yourself with current regulations. Some common violations are:

1. Killing game during a closed season.

2. Killing female or young animals during a male-only season.

3. Exceeding the daily bag limit.

4. Angling in closed areas.

5. Property damage (shooting powerline insulators, road signs, industrial equipment, etc.).

6. Night hunting or "pitlamping".

Record

Record your observations in note form as soon as possible after observing the incident. Photographs provide an extremely useful addition to these observations if they can be taken without alarming the violator. Take note of any features that will be of use to the enforcement officer in his investigations. This includes:

1. Time, date, location, and weather conditions.

2. Identification or accurate description (size, clothing, hair colour, etc.) of the violator and his companions.

3. Vehicle licence and description.

4. Evidence at the scene (head or viscera of animal, empty cartridges, etc.).

5. Actions of the violator (number of shots, etc.).

Report

Report as soon as possible to the nearest Conservation Officer, to police, or the Dept. of Fisheries and Oceans, or telephone 1-800-663-9453 toll-free. In areas where there is no toll charge to call Vancouver, call 663-9453.

The longer you wait, the more difficult it will be to investigate the violation.

Always give your name, address, and phone number to verify that your intentions are serious.

The proper official will lay charges when they have enough evidence.

HUNTING LAW REVIEW

1. Who are the primary officials for enforcing hunting laws?
2. What is the purpose of the observe, record, and report program?
3. Name three reasons for hunting laws.
4. List six illegal hunting activities.

HOW TO USE THE REGULATIONS SYNOPSIS

Use this section of the manual as a guide to understanding the Hunting Regulations Synopsis.

Table of Contents

The Table of Contents will help you find the part of the synopsis that you want. The first part includes topics that apply to B.C. in general. The second part contains information on the specific hunting regions of the province.

Important Regulation Notices

Read these carefully. They detail what is included and not included in the current synopsis. They may refer you to other sources of information that you will need.

Notices are included about changes in the synopsis from previous years. These are highlighted, usually by being printed in another colour. Pay attention to these.

General Provisions

There are fourteen general provisions in the synopsis. They are listed here in the order they appear.

1. *Important Regulation Notices*

Any important changes are noted each year at the beginning of the synopsis. Note any changes you see from previous years.

2. *Definitions*

This is a list of words that are used in the regulations and synopsis. You don't have to memorize these, but you should know where to find their definitions.

For example: what is bait? a licence year? a power boat?

3. *It is Unlawful*

This is a list of the most common regulations that guide hunting. You must know and obey these. Ignorance of the law is not an excuse for failing to comply. You will be charged and if convicted, subject to a fine, imprisonment, or loss of your licence.

Read this list carefully. Can you see how some of the laws relate to safety, wildlife management, or private property rights?

4. *Special Restrictions*

Special restrictions may be imposed some years. These will be set out usually at the beginning or end of the information concerning the hunting regions of B.C. Pay careful attention to these.

What special restrictions are there in the current synopsis?

5. *Licence Requirements*

This section is very important. It sets out the requirements for getting a licence, age limits, resident and non-resident restrictions, licence fees, and special licence fees.

All persons who wish to obtain a firearm by purchasing or borrowing one must first obtain a Firearms Acquisition Certificate (FAC). The Criminal Code sets out the requirements. Everyone over the age of 16 years who has no record of violence can get a FAC by applying to his or her local police department, filling in an application form and paying the fee of $10.00.

To get a hunting licence you must have a B.C. resident hunter number card. You can get one from the nearest office of the Government Agent after completing the hunter training programme (Conservation and Outdoor Recreation Education, or C.O.R.E.).

Are there restrictions for hunters under the age of 19. What are they?

6. *Licence Fees*

Hunting licence fees and species licence fees are set out in the synopsis. These may vary and should be reviewed before you go for your licence.

What is the fee for a resident hunter?

What is the fee for a junior hunting licence?

7. *Open Seasons (General Information)*

Open seasons are determined for each region. Unless seasons are indicated, there are no open seasons on any game animal. Seasons are subject to change and you must refer to the synopsis and to local publications.
Where are open seasons shown in the synopsis?

8. *Bag Limits and Possession Limits*

Bag limits are the total number of animals of a species that a hunter may take in one licence year. Bag limits vary from species to species and from region to region and are shown in the regional schedules.

Bag limits are printed in a different type, usually bold. Where no bag limit is in effect, the abbreviation NBL appears.

An entry such as "2(1)" for ungulates in the schedule means the season bag limit is two animals of that species in total, one of which may be anterless.

An entry such as "2" for big game (except ungulates) and small game in the schedules means the season bag limit and possession limit is two animals.

An entry such as "10(20)" for upland game birds and migratory game birds in the schedules means the daily bag limit is 10 while the possession limit is 20.

Possession limit is the maximum number of a species or type of wildlife a person may have in his possession while hunting or returning from hunting. You must be aware of the possession limit for the species you are hunting.

9. *Possession and Transport*

Detailed information is available from the Ministry of Environment offices.

You must leave evidence of species and sex on animals and meat that you are transporting. Details are set out in the synopsis.

10. *Compulsory Reporting*

Certain species of game must be reported at designated compulsory reporting centres. These include: caribou, grizzly bear, cougar, mountain sheep, mountain goat, bobcat, lynx, wolverine, and from certain areas, wolf and elk. Certain body parts are required for inspection.

This information allows the authorities to keep particularly close track of the characteristics and numbers of harvested animals so they can determine the population characteristics and bag limits for the following year.

11. *Hunting Methods*

This section sets out the hunting methods that you may and may not use. It deals with types of weapons, dogs, falcons, baiting, shooting hours, and retrieval.

It also covers special areas such as parks and ecological reserves. There are hunting restrictions in these areas, and it is important that you follow these restrictions.

12. *Limited Entry Hunting*

Some areas have limited hunting. Review the information for the areas you will be hunting in.

13. *Highway No Shooting Areas*

Certain highways are restricted areas for shooting. Check the list and observe the restrictions noted.

How far away from Highway 35 must you be in order to shoot a firearm?

What restrictions are there for Vancouver Island highways?

14. *Observe, Record, Report*

This procedure was discussed previously.

These general provisions are important for your safety, the promotion of sportsmanship, and the conservation of game animals. It is important that you are familiar with all this information and that you follow the provisions for the area and species that you will hunt.

Take the synopsis with you on your hunting trip and refer to it if you are in doubt.

Regional Provisions

Eight regions are listed in the synopsis. These regions and sub-regions are divided into management units (or "MU") that may have individual limited entry hunting, seasons, and bag limits. Compulsory reporting, seasons on various species, and other information that must be followed by all hunters are also set out.

You are required to follow this information when hunting and should make yourself familiar with the restrictions that will affect you.

Once you are familiar with the general information applying to all of B.C., turn to the portion of the hunting regulations that contain the regional information concerning the area you wish to hunt in.

Read the Regional notices to hunters, regulation charges, and restrictions that apply to hunting in that region before turning to the information concerning an individual game species and management unit in the region. Once you have determined the M.U. you will be hunting in, be sure of any portions of that M.U.

where closed areas, special areas or no shooting areas may apply. Take a current copy of the hunting regulations with you when you hunt.

Suppose you want to hunt deer north of Kamloops Lake (M.U. 3-29). Find the section of the synopsis that sets the rules for that area. What sub-region is this located in? What MU? What is the open season for Mule Deer bucks in that MU? The bag limit?

Are there any restrictions in that area concerning carrying a gun near any highways?

If you wanted to hunt grouse at the same time would the open seasons allow this? What is the bag limit for grouse? How many grouse could you take each day; have in your possession?

6

ETHICS

Goal

To encourage and direct the student's development of the highest sense of hunter ethics, and to support acceptance of a hunter's responsibility.

Objectives

The student will:

1. Recognize five reasons supporting the need for hunting ethics:

(i) Development of hunting ethics is part of the necessary evolution from hunting to live to hunting mainly for recreation.

(ii) Hunting is a privilege and requires the favorable "view" of the non-hunting population.

(iii) Increasing urbanization means fewer people will have experienced life and death in terms of obtaining food or the ways of nature.

(iv) Increasing concern for environmental quality and wildlife combined with (iii) means more people may be emotionally critical of something they do not understand or haven't experienced.

(v) Expanding population, increased free time, and better transportation means increased contact between hunters and others in the bush through multiple use of the same area.

2. Understand the most likely or serious consequence of unethical behaviour.

3. Understand the reasons supporting a given ethical behaviour or attitude.

4. Determine the best attitude or behaviour concerning the hunter in relation to:

- land owners
- hunting companions
- the public
- wildlife
- the environment
- himself or herself

DEFINITION OF ETHICS AND LAWS

Ethics are standards of behaviour or conduct which are considered to be morally right. Ethics start with the standard of behaviour of an individual person. Each person must make a judgement about what behaviour is right or wrong. People are judged by their actions. How we behave and how we follow the rules affects other people. Ethics are important guidelines for living in peace and friendship with other people.

Very often groups of people share the same ethical beliefs. When a number of hunters have similar ideas concerning ethical hunting behaviour they often form a hunting party, club, or association which expects its members to act according to the group's common code of ethics. In a situation like this, ethics are similar to laws. The ethics may be written down, or they may be known to each member of the group. A member that violates the ethics agreed upon is penalized in some way or asked to resign.

Sometimes laws are made to reflect or enforce the ethics of society as a whole. The federal or provincial government may pass a law that sets a standard of behavior that everyone must follow. Hunting laws, in part, reflect the ethics of hunters.

Most hunters have a personal code of ethics which is very similar to the laws which are associated with hunting. Usually, hunters agree that the hunting laws are fair and just, and find it easy to obey the law.

There may be times when a situation arises in which a hunter's ethics vary from the law. If a hunter came upon a young doe with a broken leg, he may feel that it is morally or ethically right to kill a seriously injured animal to end its suffering. The law, however, may prohibit the killing of a doe.

What should the hunter do? He could advise the nearest Conservation officer or other authority as quickly as possible, and report the location of the injured doe. They would attend to it quickly. Or, he could shoot the animal, and report his action to the proper authorities at the earliest opportunity.

When a hunter's personal ethics are in conflict with the law he or she will have a difficult decision to make. Review the hunting laws and determine if your personal ethics vary in any way from the law. If they do, try to understand why and anticipate how you may act in certain situations.

GENERAL OUTDOOR ETHICS

With increasing numbers of people using the outdoors for recreation, it is essential that everyone develop a sound sense of outdoor ethics. Without respect for the environment or courtesy towards fellow outdoorsmen, there will be little chance for individual enjoyment by anyone.

Some general outdoor ethics that everyone should follow include:

Be considerate of the rights of others. In a campsite, watch your noise, pets and litter. Properly dispose of human wastes; these can be a dangerous contaminant and an unpleasant nuisance.

It is particularly important to dispose of garbage where bears are a concern. Do not make a campsite dangerous for others by feeding bears.

A good camp should be self-contained.

Respect old buildings, such as abandoned farmsteads or linesmen's sheds. These can provide valuable shelter in an emergency.

Try to leave only your footprints behind on the trail. It is a legal requirement to pack out everything you bring into the wilderness. Use a litter bag and don't leave behind such things as plastic sheeting, shotgun shells, cases, cans, glass or film wrappings. Besides spoiling the appearance of the area, they can be dangerous to wildlife.

Respect all plant and animal life. Use your axe only when necessary. Don't needlessly kill other animals such as snakes.

All-terrain vehicles are especially destructive to the environment. Some ecosystems, such as tidal flats and alpine meadows, are so delicate that vegetation can take up to a century to recover from damage. Stay on the trails.

Respect trespassing laws. This includes crown lands that may have access by private roads or active logging roads.

DEVELOPMENT AND NEED FOR HUNTER ETHICS

There are probably as many definitions of "hunting ethics" as there are hunters. Basically, ethics are a code of conduct that distinguishes the sportsman from the "gunman"; behaviour that emphasizes the quality of the hunting experience and the way the hunt is conducted.

A high standard of ethics is reflected in a safe, courteous, and respectful relationship between the hunter and his companions, wildlife, and other individuals.

Hunting ethics evolved as our way of life changed. When people had to rely on hunting to provide their food there was little or no concern for "sportsmanship". Human survival demanded that animals be killed in sufficient quantities by any means.

For most people this is not the case today. Hunting is now an activity that combines pleasant surroundings with a test of ability and a knowledge of the wilderness. The rewards of hunting include the enjoyment of the outdoor experience, the challenge of nature, and sometimes the harvest of an animal. There is no room for the reckless pursuit of game at the expense of safety and courtesy.

Good hunting ethics are essential for the personal satisfaction of each hunter. They are also important as a means to gain the respect and understanding of non-hunters. The lack of ethics will often result in the loss of hunting opportunities and stricter controls over the use of firearms.

HUNTER/LANDLORD RELATIONS

Hunting on private property is a privilege, and not a right. The continuation of this privilege depends entirely on the understanding and respect of the landowner. Each time another landowner is offended hunters lose more potential hunting area. Good hunter landowner relations are based on courtesy.

Some basic rules to follow are:

Always ask permission to hunt on or travel across private land. Try to ask before the season opens so you do not disturb the landowner early in the morning of your hunt, and so you know well in advance where you can hunt. If you are refused, respect this decision gracefully.

If given permission to hunt, don't bring too many companions along; keep your party small.

Never assume that because other hunters have obtained permission to hunt on a particular piece of property that the invitation extends to you. Obtain permission yourself for every time you will hunt in a particular area.

When hunting, take extra care to avoid disturbing livestock. When entering a farm yard, unload your firearms.

Never shoot in the vicinity of the landowner's buildings or livestock.

Never harass or damage any domestic animals or equipment. If you hunt with a dog, ensure that it does not harass cattle, chickens or other animals (including the landowner's dog).

Leave all gates as you find them. If they were closed, make sure they are securely latched again behind you. When you cross fences avoid loosening the wires or posts.

Before hunting or travelling on private land, always ask for permission from the owner.

Don't litter the land with empty shell boxes, shells or cases, cans, bottles, cigarette packages or other forms of garbage.

Never walk or drive, or let your dog run over seeded land or growing crops. When driving, keep your vehicle on the trail or road at all times. Don't leave ruts on hillsides that may cause soil erosion.

When parking your vehicle, don't block others' access to buildings, equipment or roadways.

If you notice anything wrong on the property, such as vandalism, a broken fence or injured livestock, report it to the landowner as soon as possible.

Limit the amount of game you and your companions take from the property. Take less than the bag limit, since the landowner may also be a hunter.

Don't hunt on one piece of property so often that you wear out your welcome.

Before you leave, thank the landowner for the privilege of hunting the property. Offer to share your bag, or offer to help out on the property. Send a thank you card or Christmas card to the landowner to let him or her know you appreciate their generosity. Remember, a landowner has no respect for those who trespass. For the time it takes to ask, why not feel welcome and know you may come back again.

HUNTING COMPANIONS

True sportsmanship begins with your fellow hunters. Being courteous, cooperative and safe will make a hunting trip enjoyable for all. Tension and discomfort will ruin a hunt for everyone.

Safety is also important for all persons on the hunt.

There are a few rules that you can follow to improve your relationship with other hunters:

Show consideration for your companions. Be on time and ready to go at the start of the hunt. Don't invite people to join your group unexpectedly.

Don't do anything to interfere with another's hunt. Don't shoot into an area where you know or think others are hunting. Don't try to intercept game others are hunting. Work out disputes calmly if they arise.

Don't hog an unfair number of the shots. Give your companions the advantage of getting a good shot whenever possible. Show special consideration for the inexperienced or handicapped hunter by allowing them to hunt from the most advantageous position.

Invite a novice hunter to hunt with you each season. Share your hunting knowledge and experience and introduce the new hunter to the enjoyment of hunting ethically.

Don't shoot over your bag limit to fill the bag limit of others. Don't shoot more game than you plan to use.

Observe the rules of safe gun handling at all times. Insist that everyone you are with follows the same safety rules.

When travelling, confine your firearm and equipment to the smallest space possible. Don't rest your firearm against anything that may be harmed or against a companion's firearm, dog or equipment.

Do your share of the work around your camp. Don't grumble about the details of who does what or how much your share is.

Respect your companions' equipment and dog. Do not give commands to another person's dog, and do not handle another person's firearm without permission.

Do not settle down for shooting in a marsh or field less than 200 yards from the nearest hunter and do not intrude on the range over which he will be shooting. When a flight of geese or ducks is expected from a particular direction, always locate yourself parallel to the hunter who was there before you.

HUNTER AND WILDLIFE

Ethical hunters enjoy and respect the animals being hunted and the variety of other living things encountered in the bush. True sportsmen enjoy wildlife year round—not only during the hunting season.

Rules to follow to respect wildlife include:

Strive to make every kill a clean one.

Be certain your firearm is accurately sighted in before you go hunting. Practise before a hunt, and learn the distance where you can be most confident in killing game quickly and humanely.

Use the appropriate firearm and ammunition for the game you are after.

Don't shoot until you have a clear shot at a vital part of the animal. Get as close as possible to the animal.

Never shoot at a group of animals or flock of birds simply hoping you might hit one.

If you wound a bird or animal, make every effort possible to find it. Don't allow a wounded animal to suffer. If a companion wounds an animal, help look for it. If you miss a shot, carefully examine the place where the animal was to ensure that it was not hit.

Always give game animals a "fair chase". Don't use illegal hunting methods.

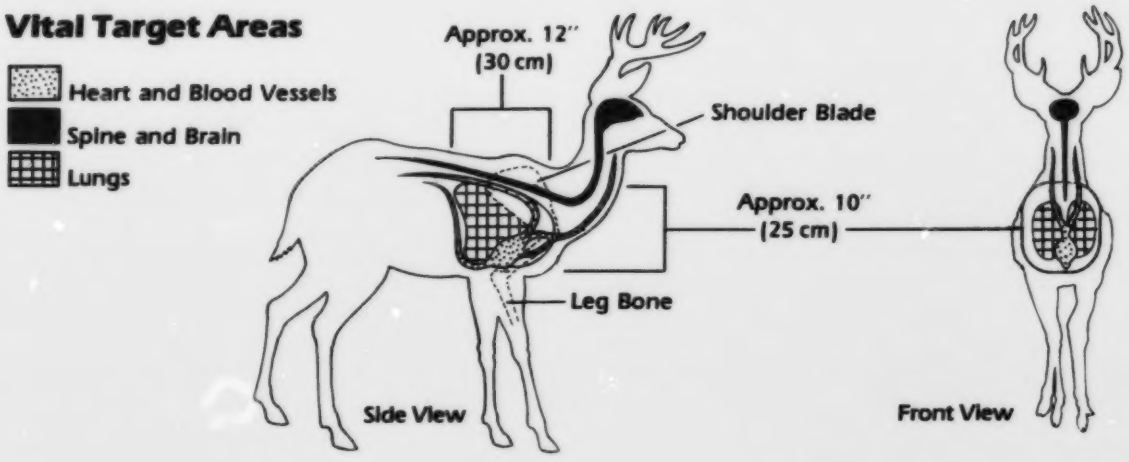
Never kill anything that you do not intend to use as food. Don't kill animals such as bears or other predators because you think they are dangerous.

Kill only the animals you are actually hunting. Never shoot at any animal for "target practice".

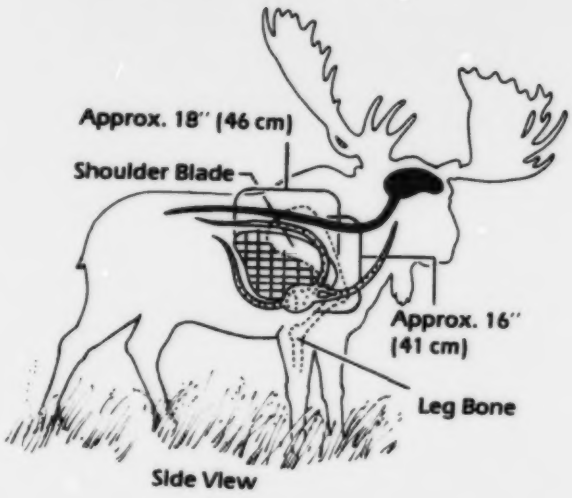
Never waste game meat. Don't kill more than you will use or are able to bring back to camp. Consider the time and how far you will have to carry out game meat before you make the decision to shoot. Don't allow meat to spoil through careless handling or storage.

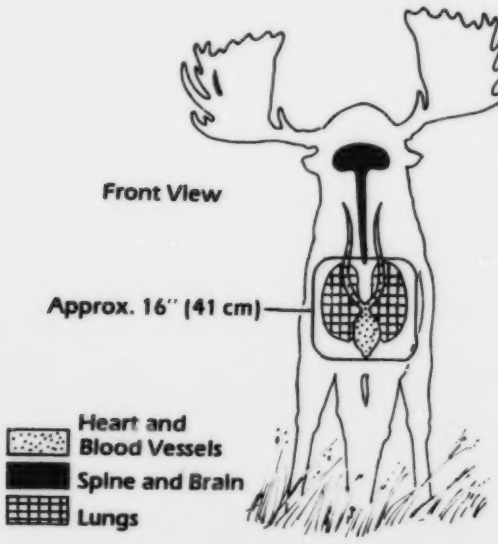
Save other usable parts of the animal such as antlers or the hide to give to someone who will use them.

Enjoy nature. Let your interest in and knowledge of wildlife extend beyond game animals to the variety of other species that live in the wilderness. Know and study nature's ways and enjoy it all year. Become involved in wildlife causes and organizations and help protect wildlife and its habitats.



Vital Target Areas





HUNTER AND ENVIRONMENT

Hunters should also respect the environment and do nothing to damage or destroy it.

Some rules to follow are:

Don't litter. Take everything out of the wilderness that you took in.

Don't carelessly damage land or vegetation. Don't cut trees, remove bark, build fires near trees, dig up plants or destroy natural vegetation.

Be careful with fire. Make sure your fire pit is constructed so the fire will not spread to tree roots, trees, dry grass or other vegetation. Use dead or fallen wood and branches for your fire.

Don't use all-terrain vehicles and 4-wheel drive vehicles on delicate ecosystems. Don't drive vehicles where you may damage vegetation, cause erosion, or destroy the aesthetic beauty of an area.

HUNTER AND THE PUBLIC

A positive public attitude towards hunting is essential if the opportunities for quality hunting are to be maintained. There are several reasons why many people find it difficult to understand or accept hunting. It is important to understand these reasons so you can help build a good relationship with the non-hunting public.

Many people now spend their entire lives in or around a city. These people have little contact with nature and the life and death that is part of nature. They may not understand hunting as a part of nature.

Many people may have no experience with firearms. They may be uncomfortable around firearms, or may have a negative image from TV or films. They may not want hunters to carry firearms in their vehicles or in the countryside around them.

Improved transportation and increased recreational time allows non-hunters to visit and use areas formerly used only by hunters. Hunters are no longer alone in the wilderness.

Many people have a concern for environmental quality and endangered wildlife. Sometimes this concern is not backed by knowledge of the reasons for the problems. The concern can easily be directed at hunters who are seen as "killing the wildlife". Such attacks on hunting divert attention away from the real problems facing wildlife such as the increasing loss of crucial parts of their habitat.

These reasons show that there is a need for a common understanding between hunters and non-hunters. Understanding, courtesy, and respect can help bridge the gap.

It is the responsibility of every hunter to improve and maintain the image of hunting and hunters. Demonstration of your own standards of hunting ethics will help. There are a number of simple things you can do towards this end:

Respect the sensibilities of others. Don't display firearms or freshly killed game where they may offend other people. What may appeal to you or other hunters may be repulsive to non-hunters.

- If you are transporting a carcass, don't display it unnecessarily. Don't tie a deer carcass to your car or leave a gut pile by the roadside.

- Don't display your firearms in your vehicle. When you carry one in public, carry it in a case or broken down and wrapped.

- Don't shoot where it may alarm or offend others, or near buildings or where people may be engaged in other activities.

Obey the rules of safe firearms handling and the laws governing hunting and firearms. Encourage others to do the same.

Leave gates as you find them

On public lands show the same respect for other users of the land and their property that you show to private landowners. Don't litter and don't harm the vegetation. Use your vehicle only on roadways and trails, and limit its use to travel to and from your hunting area.

Don't use alcohol or drugs when you are hunting. If you consume alcohol after hunting make sure your firearms are safely stored first. Limit your drinking in camp and ensure that your actions do not offend others.

Try to understand the position or beliefs of non-hunters. Accept the fact that they are sincere in their beliefs. Show them an example of good hunting behaviour.

PERSONAL ETHICS

Your personal code of ethics will be developed as you gain hunting experience. They are based on your respect for people, property, all living things, the environment, and your own image of yourself.

Realize that it is your responsibility to know how to take care of yourself in the outdoors. Respect your own limitations.

Never place your own or another's life in jeopardy by failing to notify someone where you intend to hunt and how long you will be gone. If you change your plans, leave a note on your vehicle.

Know and respect your health and physical fitness strengths and limitations. Have regular medical checkups. Exercise to get yourself fit before hunting season. Make sure your glasses or contact lenses are correct for any visual impairments.

Learn first aid and survival skills in case they are needed.

ETHICS REVIEW

1. Discuss two reasons non-hunters may not appreciate hunters, and why it is important to maintain a good code of ethics which meets public expectations.

2. Why are hunters and non-hunters coming into contact more often in the wilderness?

3. Give one example of unethical hunting behavior and the possible consequences of it.

4. List four general rules for outdoor ethics.

5. Discuss the rules and procedures to follow when hunting on private land.

6. List three rules to follow while hunting with companions.

7. How can you ensure a clean kill?

SUPPLEMENTAL MATERIAL

Blood Trailing

If you wound an animal, it is essential that you make every effort possible to find it. It is generally best not to rush after the wounded animal immediately, as this usually "spooks" the animal into a run, and increases your chances of losing it. Note the location where the animal was when hit, and wait an hour or so. However, if it is raining, the chances of losing a blood trail increase; begin trailing sooner. Be very quiet while trailing.

- Check for blood, hair or other signs to verify a hit.

- Mark the trail as you go, especially in wet weather. Mark the location of blood signs until the quantity of blood becomes an obvious marker.

- Don't disturb the trail; stay to one side. Don't trail with more than three people.

- If the blood signs disappear, mark the last sign and check all main trails for at least a half a mile. Also check to see if the animal doubled back.

- Sit down and listen. Often birds such as crows will be attracted to a downed animal.

- Wounded animals tend to go down-hill, not up-hill. Gut-shot animals may head towards water. Heart-shot animals can travel a long distance with little external bleeding.

- Be wary and alert while trailing larger animals. Sometimes a wounded bear or moose will charge a hunter when it is being pursued.

- Look at specific objects such as rocks, grass or leaves for blood spots; don't just scan the whole trail. Rub reddish spots to see if they are blood or just colour on leaves.

- When you find the downed animal, approach it quietly and cautiously. If the eyes are glazed or unblinking, it is safe to approach if it has been several hours, or overnight since you shot the animal, approach it cautiously with your firearm, and ensure the carcass has not been claimed by another large predator.

Types of Blood Sign

- Blood that is frothy with bubbles usually indicates a lung hit.

- Very dark blood may indicate a liver or kidney hit.

- Blood mixed with vegetable material, often greenish in colour indicates a "gut" or viscera shot.

- Blood with bubbles may indicate a neck hit where the neck arteries or the windpipe have been cut.

- Blood in a spattered pattern may indicate a rapidly moving animal or one in which major blood vessels have been cut.

- Blood on both sides of the trail usually indicates a pass-through wound. In some instances a one-opening wound may produce this sign if the animal doubles back on its trail.

- The height of blood sign on vegetation is an indication of wound location.

- Blood splatter drops usually point out the direction of travel of a rapidly moving animal like the fingers of a hand.

- No blood sign doesn't always mean a miss. Bleeding may be internal.

FIELD DRESSING

Field dressing is the procedure performed by a hunter to remove the entrails and skin from his game to prevent the meat and hide from spoiling.

BIG GAME

Equipment

Initially, you will require a hunting knife and sharpening stone to dress a big-game animal. In addition, an axe or small meat saw, nylon rope (30 ft. - 9 m), cheesecloth, twine and some red flagging material will be useful. Black pepper will help keep flies away from the meat after dressing and salt will help preserve the hide from spoilage.

Dressing

Remember that appropriate evidence of the animal's sex must be left attached to the portions of hide or carcass you decide to keep.

First, you must decide whether you want to have the head mounted as a trophy. If so, use the procedure outlined for trophy animals described later in the chapter. If the head is not to be used as a trophy mount, the following method of field dressing is recommended.

Lay the animal on its side or, if possible, on its back. It is not necessary to bleed the animal as sufficient bleeding will occur from the bullet wound and the cuts made to dress the animal.

With a sharp hunting knife, cut through the skin and abdominal wall from the crotch to throat. Be careful not to puncture the intestines or the stomach and avoid getting hair in the body cavity. Split the breastbone with your knife or axe. Loosen the organs in the body cavity by cutting all connecting tissue including the diaphragm. Cut

carefully around the vent in the rump — be careful not to puncture the intestine. Loosen the intestine enough to pull it out after tying the vent closed with a piece of string. This will prevent body wastes in the intestine from spilling onto the meat when you remove the entrails.

Now with the carcass on its side, turn its head uphill. Cut the windpipe free at the throat. Hold the windpipe in one hand and pull backward. With the other hand, free any internal organs by cutting through the tissue attaching them to the animal. Strip all the entrails from the body cavity. Recover the liver and heart if desired. Prop the chest cavity open by spreading the ribcage apart with a stick. Wipe blood and other waste matter from the inside of the carcass. Trim away all damaged parts. If possible, clean the body cavity with damp cloths. Be sure to thoroughly dry the body cavity after washing as a dry surface will help check spoilage of the meat.

Skinning

Antlered or Horned Animals

Game should be skinned as soon as possible after the animal is dead. Skinning is easiest when the carcass is warm.

First, decide if you want to have the head mounted as a trophy. If so, follow the skinning procedure outlined for trophy specimens. Otherwise, the following skinning procedure is recommended.

Non-Trophy Animals

The steps in skinning most big game animals which have antlers or horns are the same.

If possible, hang the animal off the ground upside down; otherwise skin it where it lies. If possible, move it to an area of level ground or to your hunting camp before removing the skin. This will prevent dirt and other debris from getting on the meat while it is being transported.

Cut along the inside of each leg from above the knee joints to the belly incision. Next cut around each leg at the knee. Then cut completely around the neck to join the cut made along the throat when the windpipe was removed.

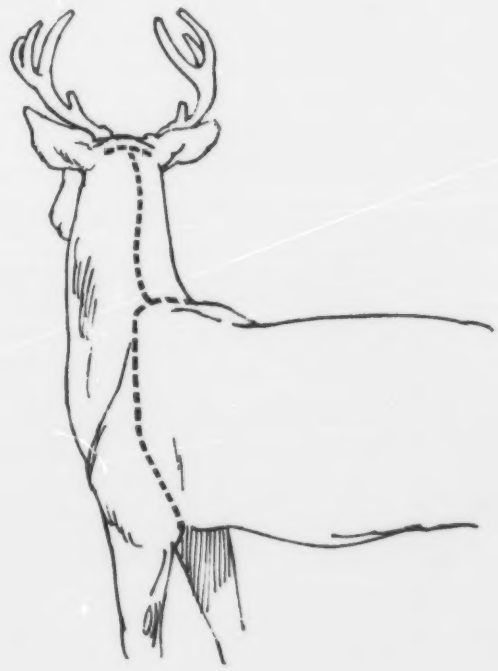
Cut the meat and tissue around the knee joints to remove the lower legs. Discard them along with the tarsal (scent) gland on the inside of the leg. If your knife has touched the tarsal gland, wash the knife before proceeding. Now use your knife carefully to free the skin from the body by cutting the connecting tissue in between. Once the hide has been peeled back from the hind legs, cut through the tail. This will enable you to remove the hide in one piece.

Retain the hide by trimming away excess fat and tissue and salting it to prevent spoilage. The hide can be tanned later to make leather for gloves, jackets and other clothing or it can be donated to others for such use.

Trophy Animals

When skinning an antlered or horned animal for mounting, do not cut the skin of the throat because this will ruin the cape. Start by circling the shoulders. Begin at a point on the back between the shoulder blades and cut down each side to a point behind the front legs. Next, cut a curve over the two front legs to connect with the breast incision. Then make a cut along the back of the neck to a point between the ears and the base of the antlers or horns. Cut from this point to the base of each antler or horn to form a "T" shaped cut on the top of the head.

Now free the hide around the neck and shoulders by pulling the hide away from the body while cutting all the connecting tissue with a knife. At this point, the



remaining steps necessary to skin out the head can be greatly simplified by cutting off the animal's head.

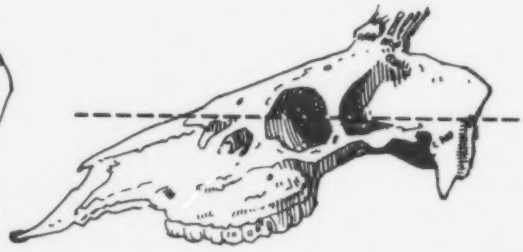
To remove the head, cut through the muscle covering the large neck joint immediately behind the skull. Bend the head back to expose the first vertebrae where it joins the skull. Cut as much tissue free around this joint as you can. Then twist the head off.

Once the skull is free, work carefully toward the base of the ears. Skin over the muscle at the base of each ear until yellow cartilage is visible. Cut down and forward through this cartilage to the skull to free the ears. Continue skinning along the head to the base of the antlers or horns. With the point of your knife, cut upward, close to the skull and around the base of the antlers or horns, freeing the skin attached to them as you proceed. Once the skin has been freed and pulled forward, insert the forefinger of your left hand under the rear edge of the eyelid from the outside. Pull taut and cut the tissue between the eyelid and bone until the tear duct is reached. Continue skinning close to the bone until you reach the corners of the mouth. Insert your forefingers in the mouth and lift the lips. Sever the cheek muscles about three-quarters of an inch (2 cm) from the corner of the mouth. Skin close to the bone until the lower lip is free, being very carful not to split the lip. Leave the upper lip attached for the time being.

Skin out the muzzle up the nostrils. Then insert your finger in the nostrils to guide you as you cut through nose cartilage to the bone. Skin close to the bone until the nose and upper lip are free.

Skin out the remainder of the carcass as described for non-trophy animals.

Use a bone saw to cut the top off the skull with the antlers or horns attached. Leave a fairly large portion of skull attached to the antlers for use in mounting your trophy.

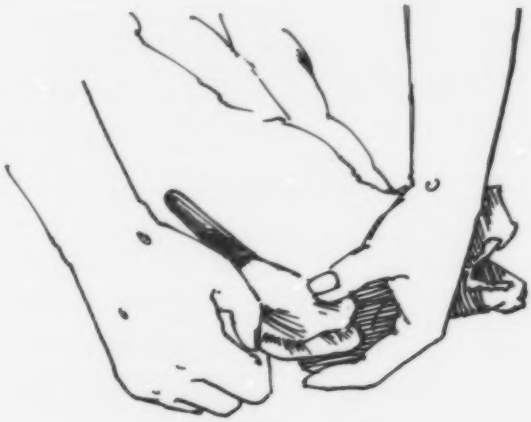


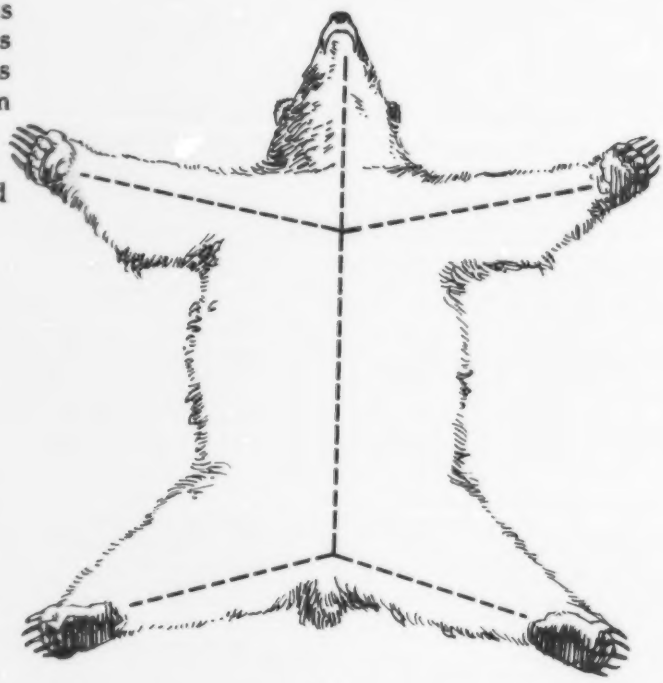
B.C. game laws may require you to submit the skull or a portion of the lower jaw or other body parts to a compulsory reporting centre. Be sure to recover them.

Once the hide is back in camp, finish skinning it out as soon as possible. Open the lips and nose by slitting the fleshy parts from the inside. Remove excess fat and flesh hide. Cut away the flesh from the base of the ear cartilage. Separate the skin from the cartilage only at the back of the ear. to do this, cut the tissue connecting the skin

to the cartilage, cutting with the knife as necessary and turning the ear inside out as you skin. A long, blunt pointed stick is helpful in turning the ear. Extreme care is necessary while separating the skin from the cartilage or the ear will tear.

Salt your cape thoroughly as described elsewhere in this chapter.





Two Important Points To Remember:

If you are unsure about your ability to skin out a trophy head properly, you can leave the cape intact on the head and neck and have a taxidermist skin it out for a nominal fee.

If you skin a trophy head, be extra careful when cutting around the lips, eyes, ears and nose to avoid cutting through the skin.

Bears, Wolves, Coyotes, Cougars

To skin a bear, cut from the tip of the tail along the centre of the abdomen to within about three inches of the lower lip. Cut the hind legs starting from the inside edge of the pad near the heel, along the centre of the leg until the cut meets the incision in the abdomen. Sever the foot from the carcass, leaving it attached to the hide. Repeat this procedure for the front legs. Now peel the skin off the carcass working from the hind end forward. Remove the skin around the head in the same fashion as for antlered animals except avoid cutting the hide on the top of the neck, shoulder and head.

Cougars, coyotes, wolves and similar large animals are skinned like a bear. Open the long tail along the centre line on the underside with the tip of a sharp knife. Be careful to cut in a straight line — do not zig-zag from side to side. Leave the feet and claw on the pelt, especially if the skin will be used as a rug.

Hanging and Cooling

It is not always possible to skin out big game animals immediately. However, all big game should be kept off the ground after field dressing. The meat on an animal's back is insulated from cool air by its hide and by the ground on which it is lying. Unless it is cooled, it will spoil. The best way to cool the meat is to hang the carcass in a shady, cool place. A block and tackle is the easiest way to hoist a large animal. If this is not available, improvise a winch using nylon rope.

If the animal cannot be hung until later, prop the body cavity open with sticks. Place it belly down over some logs or rocks and cover it with spruce boughs to keep flies and birds away.

In warm weather, black pepper can be sprinkled over the carcass to keep flies off. Once the animal has been skinned, it should be covered with cheese cloth to keep it clean while it cools.

Preserving the Hide

It is essential to salt a hide thoroughly soon after its removal to preserve it for taxidermy purposes. Use comon table salt or pickling salt in the amounts indicated in the following table:

Game species	Amount of salt required	
	Cape only	Whole hide
Antelope	1 lb (.4 kg)	3 lbs (1.2 kg)
Mountain Sheep	2 lbs (.9 kg)	4 lbs (1.8 kg)
Deer	2 lbs (.9 kg)	5 lbs (2.2 kg)
Caribou	3 lbs (1.3 kg)	8 lbs (3.6 kg)
Elk	4 lbs (1.8 kg)	15 lbs (6.6 kg)
Moose	5 lbs (2.2 kg)	20 lbs (9.0 kg)
Black bear		5 lbs (2.2 kg)
Grizzly bear		10 lbs (4.5 kg)

Lay the hide flat on the ground, fur side down and stretch it to its fullest extent. Sprinkle salt freely and evenly over the entire hide. Rub the salt vigorously into the skin with the flat of your hand. Be certain the edges of the skin are thoroughly salted. Work salt into the lips, ears, nose and other difficult areas to ensure it covers them completely.

Salt draws the moisture out of the hide. After leaving the salted hide exposed to the air for 24 hours or more, sprinkle salt lightly over the hide once more. Then fold it up towards the skin side. Keep it cool until it is delivered to the taxidermist. Don't place it in a plastic bag or closed container while transporting it.

Bear skins require a little extra care when salting. As much excess fat as possible should be removed from the skin before salting. Open the ears, nose and lips and cut away as much fat as you can. Be careful not to cut the hair which is rooted to the inner surface of the bear skin.

The feet should be skinned out to the last joint of the toes and the bones disconnected. Cut away all fatty tissue. Use plenty of salt and rub it in well. If there appears to be an excessive amount of grease, rub wood ashes into the greasy areas to absorb it.

Salting a skin is always preferable to stretching and air drying it. Only when salt is not available should you cure a skin by stretching it in a frame or pegging it on the ground. Pegging will leave holes in a skin's edges which must be trimed away, wasting part of the skin.

Even though a skin may be stretched larger than its original size, it will revert to its normal size when tanned. After curing, treating and tanning is complete, a skin that has been stretched and air dried will probably be smaller than if it had been salt cured.

Transporting

If you are backpacking game from field to camp, tie red flagging on your packsack. If the animal has antlers or horns, tie red flagging around them as well so you will not be mistaken for an animal by other hunters. A bell tied to your pack-frame will also help others recognize you as a hunter returning from the field.

To prevent damaging the hide, do not drag game along the ground or roll it downhill. If an animal must be dragged, lay it on a blanket or coat, or put a layer of brush or boughs underneath the animal. Pull the animal along by its head.

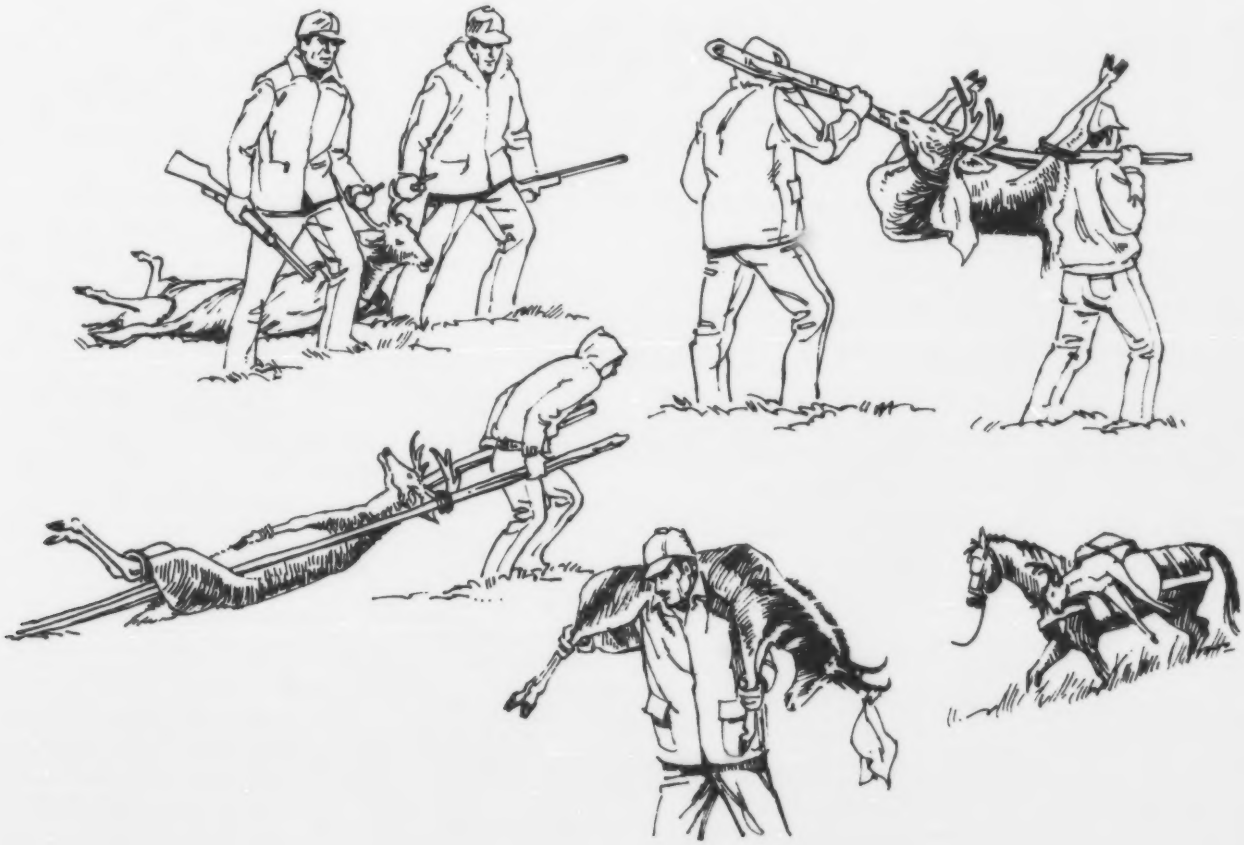
When carrying an animal or hide on horseback, be carful that ropes used to hold it in place do not rub the skin and damage the hide. A blanket, cloth or layers of grass placed beween the ropes and hide will prevent damage.

A burlap bag is useful for carrying a hide or meat from field to camp.

When transporting game by vehicle be sure to keep the carcass away from heat, gas, sunlight and road dust to prevent its spoilage.

Butchering

The most effective way to cut up your game is to have it done commercially at a butcher shop. For a reasonable charge, they will cut, wrap and freeze your meat with minimum waste. If you choose to butcher your game yourself, meat cutting guides are available at many bookstores.



USE OF DOGS

- Only use dogs when it is lawful for the game you are hunting.

- Use only well-trained dogs. Puppies and untrained dogs should be left at home.

- Never feed, touch, play with, or give commands to someone else's dog without the owner's permission.

- Make sure your dog is not in the line of fire, or does not interfere with other hunters.

- Keep your dog in top condition and teach it to be well mannered in camp. Don't leave dogs unattended or in locked vehicles when it is hot.

- A well trained dog can make a wonderful hunting companion. For some types of migratory and upland game bird hunting and retrieval, a trained dog is almost a necessity for a successful and productive hunt. Following the restrictions described in the current hunting and trapping regulations synopsis, a dog may be used in the hunting and trailing of some big game species.

Fisheries management is generally considered to be regulation and manipulation of fish stocks. In practice, it often has more to do with managing people rather than fish. Sport fishing combines cultural and ethical values with social and economic factors. Thus, the reasons someone goes fishing range from the challenge of catching a fish, to gathering food, running a business, and maintaining traditions. Fishing also has many dimensions related simply to the enjoyment of the outdoors. Therefore, while the opportunity to take home a fish is a part of this experience, the days of managing fish only for maximum harvest are gone forever.

As with all renewable resources, the continuing success of freshwater fisheries depends on their careful conservation. They must be used wisely. Fisheries managers, like their wildlife counterparts, work with techniques to significantly alter the number, abundance and distribution of freshwater sport fish as well as their use.

The most important consideration in fisheries management is the maintenance of both crucial and quality habitat. This is also the greatest problem facing the fisheries manager. Water is an essential element for life on this planet. However, development has treated many waterways like sewers. Water systems that are everything from cradle to grave for sport fish have been conveniently used by some communities and industries as a cheap and convenient way to dispose of wastes. Many chemicals and poisons used on land, like garden fertilizers and pesticides, eventually run off and end up in the water. All these factors can drastically reduce the survival of fish, their eggs and young, and the small animals that they depend on for food.

In British Columbia, the Recreational Fisheries Branch manages freshwater fishing to produce a range of outdoor experiences. These vary from frequently stocking lakes in busy urban areas, some reserved for kids only, to managing streams exclusively for fly fishermen. One new aspect is the designation of Special Fisheries; water managed primarily for the quality of the angling experience. The first Special Fisheries was on the lower Dean River. The total number of anglers is controlled by a permit system, and power boats and camping activities are restricted. Thanks to these measures, opportunities to angle in uncrowded wilderness surroundings have been preserved for the future.

Fisheries management in British Columbia has required extensive research into the province's abundant waters and fish resources. This began in 1948 when the first fisheries biologist was added to what was then the British Columbia Game Commission. This led to regulations aimed at sustained production, conservation, and wise use. Early regulations were based on protecting spawning fish, and preventing heavily fished populations from being reduced to dangerously low levels of abundance. Later, as the number of anglers continued to grow, regulations were developed to improve the quality of the angling experience and share the catch.

While regulations allow fisheries biologists to control some of the effects of angling on fish stocks, they are based on the principle that restrictions should be as few and uncomplicated as possible.

Fisheries management is as much an art as a science. Some regulations worked well, but others, especially in the early years, were not as successful, and the managers learned by experience. Steelhead, the mighty sea-run rainbow trout, is a good example. Never very abundant, the steelhead that return to most coastal British Columbia rivers number in the hundreds, or fewer. With little information on their numbers, biologists did not understand how small and fragile the steelhead runs were. Large sport catch limits, combined with incidental catches by commercial fishermen and native Indian nets, led to the depletion of many accessible steelhead runs by the mid 1970's. Biologists then introduced regulations requiring the release of all sport caught wild steelhead on most southwest British Columbia rivers.

These catch-and-release regulations, with hatchery stocking in some cases, were very unpopular at first, but have been responsible for rebuilding many of the depleted steelhead runs. Most rivers now sustain more steelhead angling than in the glory days of the early 1970's; the difference being that now most fish are returned live to the river, to be caught again, and eventually to spawn.

Catch-and-Release

There is a growing trend among anglers to release, unharmed, a portion of their allowable catch. Fisheries managers heartily support this philosophy of voluntary "catch and release". However, a fish may not survive if carelessly handled. By following a few simple rules, anglers can be certain that released fish will live to spawn and/or be caught again.

1 ***Quick release.*** Time is of the essence. Play and release fish as rapidly as possible. A fish played gently for too long may be too exhausted to recover.

2. ***Keep the fish in the water as much as possible.*** A fish out of water is suffocating and, in addition, is many times heavier. Also, the fish may seriously injure itself if allowed to flop on the beach or bottom of the boat. Even a few centimetres of water under a thrashing fish acts as a protective cushion.

3. ***Be gentle.*** Keep your fingers out of the gills. Do not squeeze small fish—they can easily be held by their lower lip. Nets may be helpful as long as the mesh does not become entangled in the gills. Cotton meshed nets do the least damage to a fish. Keep the net in the water; hooks and lines tangling in nets may delay release.

4. ***Careful unhooking is essential.*** Remove the hook as rapidly as possible with longnose pliers. ***If the fish is deeply hooked,*** cut the leader and leave the hook in. Be quick but gentle—***do not*** roughly tear out hooks. Small fish are particularly susceptible to the shock of a torn-out- hook.

5. ***Revive unconscious fish.*** Some fish, especially after a long struggle, may lose consciousness and float belly up. Always hold the fish in the water right side up, (heading upstream in streams). When the fish revives, begins to struggle and can swim normally, release it.

As British Columbia's population and its reputation for world class angling grows, more and more programs to increase fishing opportunities are required. The Salmonid Enhancement Program (SEP) was initiated by the federal and provincial governments, in 1977, to rebuild depleted Pacific stocks of salmon and trout. Since then, SEP has invested over $300 million in enhancement activities. The Habitat Conservation Fund (financed by surcharges on fishing, hunting and trapping licences), and the Public Conservation Assistance Fund, which encourages public groups to get involved in fish and wildlife projects, have also financed many worthwhile fish habitat improvement projects. These projects take many forms. Biologists can enlarge, improve or create new habitats for sport fish. Building fish ladders is simpler. Creating fishways, removing obstructions to migrating fish, cleaning spawning gravel, improving fish access to river side channels, and regulating stream flow can greatly increase the productivity of fish habitat. In lakes with chronic winter kill problems, the depletion of oxygen can be corrected by installing pumps which bubble air up from the lake bottom throughout the winter.

Many small water bodies in British Columbia are stocked with various species of game fish, particularly in the populated southwest. This helps to support the high level of angling pressure in more populated areas. However, there are problems with too much reliance on stocking programs, and care is taken to ensure that wild stocks provide most of the fishing in the province. In most cases where stocking is used, eggs are taken only from wild adult fish already part of the system to be stocked. In this way, the natural variability and genetic diversity of wild stocks are maintained as closely as possible.

A major part of the fisheries manager's job is the protection of natural, undisturbed habitats where fish can spawn and grow in relative security, and where people can fish and find peace from the hectic pace of modern life. Fisheries biologists spend a lot of time persuading people that fish and their aquatic habitats are valuable and can be seriously affected by many development projects.

One chronic problem fisheries managers face is the need to communicate with the general public. The CORE program is an important way of doing this. A better informed public helps fisheries managers in many ways. They are aware of the importance of fish and their habitats. They understand the need for rules and regulations, and will observe and report regulation infractions and pollution cases. Understanding and education also help people to appreciate that dumping waste motor oil and anti-freeze into local sewers usually kills fish in nearby streams; and to understand the importance of not moving "coarse" or undesirable fish from one water body to another.

Some Fishing Do's and Dont's

Don't Move Live Fish

Fisheries biologists are very concerned about "coarse" or undesirable fish species being introduced into our valuable game fish lakes.

The illegal movement of live fish may be the result of a well-meaning attempt of an angler wanting to improve the fishery, youngsters who collect live minnows for fun and release them in another lake, or anglers who collect aquatic insects for bait and transport them in jars with lake weeds which may harbour young fish or fish eggs. This can result in the introduction of a competitor or predator species of fish, that can destroy the local fishery.

Of great concern is the threat coarse fish introductions pose to brood stock lakes. Our hatchery system is the only one in North America that collects 95% of its eggs from wild fish each year. This places critical importance on the lakes and streams which support egg collection operations. If a key broodstock lake is lost to coarse fish, the sport fishing in many lakes and streams will decline. The northern pike is one example of a game fish which must not be moved under any circumstances. Pike often carry parasites which, when transferred to other fish, make them unpleasant to eat. The effect on both commercial and sport fisheries, especially those for salmon, trout and whitefish, can be disastrous.

Attempts to control coarse fish are very limited. Since 1947, fisheries staff have chemically treated lakes with a natural organic substance called rotenone, to remove or reduce coarse fish populations. The lake is then restocked soon after with game fish. However, this treatment is only effective for small lakes. Barriers placed on streams may allow game fish to pass and deny access to some coarse fish. However, many species, like sculpins, suckers and squawfish, do not always need to use streams to reproduce - they can spawn in lakeshore areas.

Please Remember:

- Don't move live fish or aquatic invertebrates (insects) from one body of water to another for any reason!
- Don't release any aquarium fish to natural water bodies.
- Do report any such moves you see, including the use of live fish as bait.

BRITISH COLUMBIA ANGLING ETHICS

Ethics are standards of behaviour which are considered to be morally right. Please read and follow this angling code of ethics to make fishing enjoyable and productive to all.

1. ***Emphasize the Angling Experience.*** Consider the style of fishing and the size of the fish you hope to catch, and choose the appropriate gear to give the fish a sporting chance.

2. ***Release Live Fish.*** Releasing fish is heartily supported by both fisheries managers and many sport fishermen. Use all possible care and a minimal amount of handling to ensure the fish you release will live to spawn and/or be caught again.

3. ***Respect the Environment.*** Don't leave any garbage on land or in the water. Leave your fishing site in the same, or better, condition than you found it.

4. ***Be Courteous to Your Fellow Anglers.*** Leave room for others to fish. Disturb the fish as little as possible. Don't remain in one fishing spot too long if others are waiting. Be cooperative and understanding.

5. ***Be Courteous to Others.*** Lakes, streams and their surrounding environment are used for a variety of recreational activities. Take care to minimize conflict with other people's enjoyment.

6. ***Respect the Right of Landowners.*** Request permission for access across private property. If you open a gate, be sure to close it securely.

7. ***Understand the Reasons for Sportfishing Regulations and Respect Them.*** Know and abide by all fishing regulations. Strive to understand the reason for their existence and encourage others to do the same.

Angling Violations

The unethical angler who disobeys fishing regulations, or anyone who damages fish habitat, is a threat to fisheries resources and outdoor recreation. Anglers can recognize and help prevent offences by being familiar with the current regulations, and by participating in the Observe, Record and Report program.

If you ***observe*** a violation of the fishing regulations, ***record*** your observations in note form promptly and take photographs, if possible. Notes should include date, time, location and weather conditions; identity of violator(s) and companions or an accurate description of them; boat or vehicle description and licence number; evidence at the scene; and action of violator(s). ***Report*** your observations as soon as possible to the nearest Conservation Officer, R.C.M.P. or Department of Fisheries and Oceans. Do not confront a suspected violator. Only a Conservation Officer or Constable is legally authorized to seize property or make an arrest.

The fun of "goin' fishin'" has been hooking anglers for centuries. "A gentle and artistic sport" said the late Roderick Haig-Brown, "with infinite scope for ingenuity and association that make for growth of the soul". At least 330,000 British Columbians would agree. A 1985 survey showed that this number of resident fishermen spent almost 5 million days fishing the province's freshwaters, while 97,000 non-residents spent 550,000 days fishing. Thousands of people each year also visit provincial hatcheries, spawning channels and natural spawning runs. A large number of people are also involved in enhancement projects, education, and "fish watching" activities, all of which have little to do with actually fishing.

Enjoy your "fish" experience, and protect and conserve the wonderful and important aspect of British Columbia's history

The Species and Distribution of Sport Fish

The portion of North America now known as British Columbia was covered with hundreds, perhaps thousands of feet of ice as recently as 10,000 years ago. At that time no fish life could exist, but with the retreat of the glaciers, fish began to move back into the area from several directions.

Some species came northward across what is known as the international boundary; some southward from an unglaciated area of Alaska; and some species, capable of living in salt water, invaded various river systems from the sea. A few species which moved up the Mississippi basin from further east, became established in Alberta and later crossed the Rocky Mountains by one of several methods into British Columbia.

The majority of the sport fish in British Columbia belong to the Salmonid family. The salmonids are divided into three groups: the trout, (rainbow, cut-throat and brown) the char (Dolly Varden, brook "trout" and lake "trout") and five species of Pacific salmon (chinook, coho, sockeye, pink and chum). Pacific salmon ascend from the ocean, spawn and invariably die while the trout and char are all capable of spawning more than once. Trout, except for browns, characteristically spawn in the spring while char, brown trout and Pacific salmon spawn in the autumn.

Trout

Only two species of trout, rainbow and cutthroat, are native to British Columbia, but these display a bewildering array of different forms which has led to many common names. Sea-going rainbows are known as steelhead trout; these fish ascend most of the streams along the mainland and on Vancouver Island. Some swim long distances up-river on their spawning migration; steelhead in the Fraser River reach Prince George more than five hundred miles from the sea.

The inland rainbow trout are often incorrectly called "Kamloops" and are by far the most important sport fish in British Columbia in terms of both numbers of fish caught and angling effort. The rainbow is characteristically a lake fish but they enter streams to lay their eggs. The young spend a variable time in the stream following hatching and return to the lake to grow and to mature.

The other native trout species, the cutthroat, is distinguished from the rainbow by the presence of scarlet or orange slashes of colour under the lower jaw and the occurrence of a patch of teeth at the back of the tongue. Cutthroats show a series of different forms and life histories somewhat similar to those of the rainbow although they have not acquired the same variety of local or common names.

The two distinct varieties of cutthroat trout occurring in British Columbia likely attained their present distribution by two different routes. Sea-going cutthroat trout are common in the rivers of Vancouver Island and the mainland coast. The length of time spent in fresh water varies and, like rainbow trout, it appears that some individuals remain indefinitely in the streams or lakes while others spend considerable time in salt water.

A second type, known as the west slope (Yellowstone) cutthroat trout, occurs principally in the Kootenay region of south-eastern British Columbia. These fish differ noticeably from their coastal relatives in the degree of spotting and have a life history quite similar to the rainbow trout. This strain of fish probably developed in freshwater lakes isolated in the Montana region during the last glacial age . As the ice retreated these fish apparently moved northward to occupy their present range on both slopes of the Rocky Mountains. The coastal cutthroat, on the other hand, probably survived the glacial age in coastal

streams of Washington, Oregon and California and has since moved northward via the sea and ascended successive river systems toward the north.

Because all the native trout of British Columbia moved in from the south, few as yet are present today in the northern waters of the province. Both species occur in coastal streams north to Alaska but few are found in the Liard River drainage which empties via the Mackenzie River into the Arctic Ocean. Rainbow trout occur in the Parsnip and Peace Rivers and probably have invaded this part of the Arctic drainage in comparatively recent times.

The brown trout, a native of Europe, has been introduced to the Kettle River system and to several streams on Vancouver Island. It has become established in good numbers in the Cowichan River. Like other species of trout it may enter the sea. It is recognizable by its large dark spots surrounded by pale halos.

Char

Like the trout the char of British Columbia consist of two native species with an additional introduced species. Dolly Varden and lake trout occur naturally, while the brook trout has been introduced from eastern North America. The use of the term trout for the two latter fish is incorrect as they should more properly be called the "Great Lakes Char" and "Speckled Char" respectively; however, local names are deeply rooted and are not likely to be altered easily.

The most wide-spread char in British Columbia is the Dolly Varden. Like the two native trout, the Dolly Varden occurs in a variety of local forms including sea-run fish, non-migratory coastal and interior forms (one often called "bull trout") and dwarf mountain races. Unlike the trout these different types are not usually distinguishable by separate common names. Dolly Varden are widely distributed in both lakes and rivers, and although they are large and often brilliantly coloured fish, they are not as well esteemed a sport fish as the rainbow.

The other native char is the lake trout. In British Columbia it is native only to lakes from Shuswap Lake northward and is absent from the Columbia River system and Vancouver Island. It has been introduced to Alouette Lake in the Lower Mainland in an attempt to produce a sport fishery in this large, relatively unproductive body of water.

The brook trout has been introduced to many lakes and rivers of the southern interior, Cariboo and Kootenay regions and to a few bodies of water on Vancouver Island and the northern regions. Smaller than the other char, they have proven to be more successful than native species in some localities and are providing considerable sport fishing. Icefishing during the winter months for brook trout has become an increasingly popular family sport during the past decade.

Pacific Salmon

Of the five species of Pacific salmon, the chinook and the coho are most widely sought as sport fish. The chinook, also known as spring or tyee, ascends all the major coastal rivers, usually in August and September. These powerful fish may travel spectacular distances up-river to reach the spawning grounds; some enter Teslin Lake in north-western British Columbia after ascending the Yukon River, eighteen hundred miles from the Bering Sea.

The other principal Pacific salmon of sporting interest is the coho, which spawns in all the coastal streams of British Columbia. Young coho go to sea after one year and return as adults usually two years later.

They are angled for not only in salt water but also after they have re-entered freshwater streams on their spawning migration. Although pink or humpback salmon and chum or dog salmon are assuming greater importance in saltwater angling catches each year, they are not legally harvestable by anglers in fresh water. The sockeye salmon, the most important commercial species, is also not a freshwater sport fish; however, land-locked races of sockeye, known as kokanee, occur in many lakes on the mainland (Okanagan, Cariboo, north-central British Columbia and the Kootenay region) and on Vancouver Island. These fish are identical in appearance to sea-going sockeye salmon except that they are notably smaller and usually mature from 8 to 16 inches in length. Kokanee spawn in the fall in streams or on gravel shores in lakes. They have been artificially introduced to many lakes in British Columbia and in some instances provide an extensive sport fishery. Kokanee populations probably have developed independently from migratory sockeye salmon in each locality where they occur naturally.

Other Sport Fish

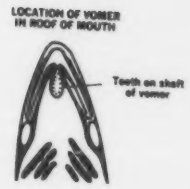
The Arctic grayling is a sport fish closely related to the trout and char. This trout-like fish is characterized by an immense dorsal fin which is often beautifully marked with red and blue. Arctic grayling have a distribution in British Columbia which complements that of the trout; grayling abound in the Mackenzie River system (the Peace and Liard River basins) and in the Yukon River but are absent from the southern two-thirds of the province. They thus provide an attractive sport fishery in a region lacking trout. In south-eastern British Columbia, grayling which have spread northward from stock planted in western Montana have been taken in several tributaries of the Flathead River.

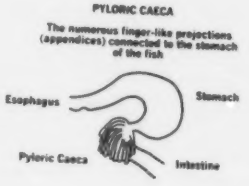
A more wide-spread species of fish, often erroneously called "grayling" but easily distinguishable by the lack of a large dorsal fin, is the mountain whitefish. These are abundant in most of the river systems of the province except on Vancouver Island and provide an important fall and winter fishery particularly in the Kootenay region.

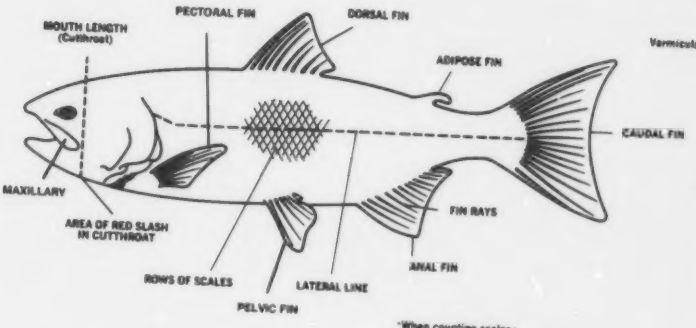
Two types of fish which are important to anglers east of the Continental Divide occur only in the North and have as yet received limited attention from anglers. The Northern pike or jackfish and the walleye (pickerel) occur in the Peace and Liard River systems of the province. Recently, walleye have entered from the south through the Columbia River near Castlegar.

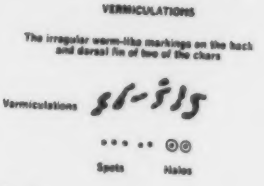
A few other species of fish provide angling in restricted areas of the province. Certain warm water sport fish, notably the smallmouth and largemouth bass, have been artificially introduced into a few lakes in southern British Columbia and yellow perch into lakes of the Peace River area. The burbot (or ling) is a widespread native fish which provides some winter sport. White sturgeon, some of which migrate to sea and others of which are land-locked, occur in both the Fraser and Columbia River systems and attract fishermen largely because of their occasional immense size and their fine eating qualities.

KEY
to the trout, salmon, char, grayling and whitefish of British Columbia

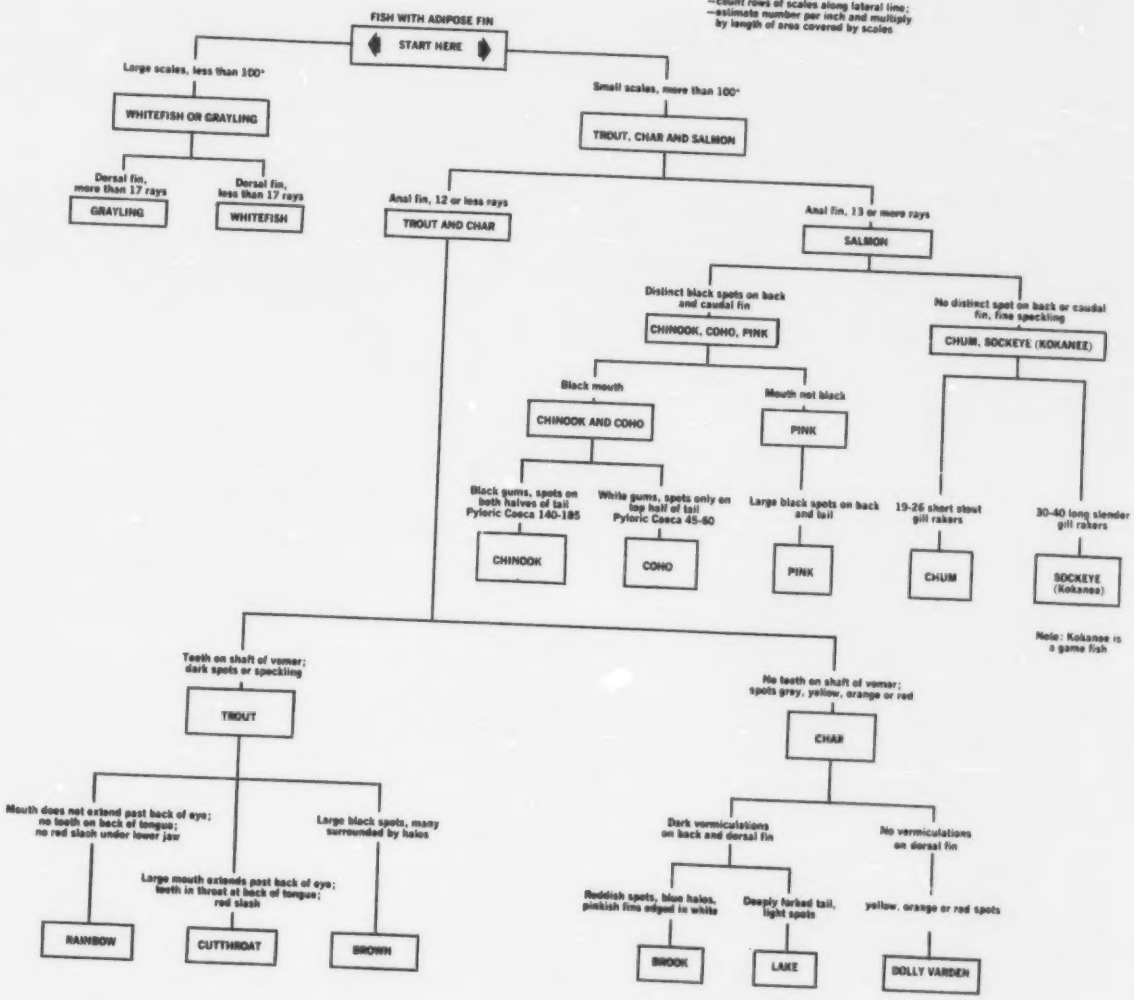








*When counting scales:
—count rows of scales along lateral line;
—estimate number per inch and multiply by length of area covered by scales


FISH WITH ADIPOSE FIN
START HERE
Large scales, less than 100*
WHITEFISH OR GRAYLING
Dorsal fin, more than 17 rays
GRAYLING
Dorsal fin, less than 17 rays
WHITEFISH
Small scales, more than 100*
TROUT, CHAR AND SALMON
Anal fin, 12 or less rays
TROUT AND CHAR
Anal fin, 13 or more rays
SALMON
Distinct black spots on back and caudal fin
CHINOOK, COHO, PINK
No distinct spot on back or caudal fin, fine speckling
CHUM, SOCKEYE (KOKANEE)
Black mouth
CHINOOK AND COHO
Mouth not black
PINK
Black gums, spots on both halves of tail
Pyloric Caeca 140-185
CHINOOK
White gums, spots only on top half of tail
Pyloric Caeca 45-60
COHO
Large black spots on back and tail
PINK
19-26 short stout gill rakers
CHUM
30-40 long slender gill rakers
SOCKEYE (Kokanee)
Note: Kokanee is a game fish
Teeth on shaft of vomer; dark spots or speckling
TROUT
No teeth on shaft of vomer; spots grey, yellow, orange or red
CHAR
Mouth does not extend past back of eye; no teeth on back of tongue; no red slash under lower jaw
RAINBOW
Large mouth extends past back of eye; teeth in throat at back of tongue; red slash
CUTTHROAT
Large black spots, many surrounded by halos
BROWN
Dark vermiculations on back and dorsal fin
Reddish spots, blue halos, pinkish fins edged in white
BROOK
Deeply forked tail, light spots
LAKE
No vermiculations on dorsal fin
yellow, orange or red spots
DOLLY VARDEN

Rainbow Trout (Skagit River)
MAX. SIZE APPROX. 15 INCHES
Rainbow Trout (Duncan River)
MAX. SIZE APPROX. 45 INCHES
Coastal Cutthroat Trout
MAX. SIZE APPROX. 30 INCHES

Dolly Varden

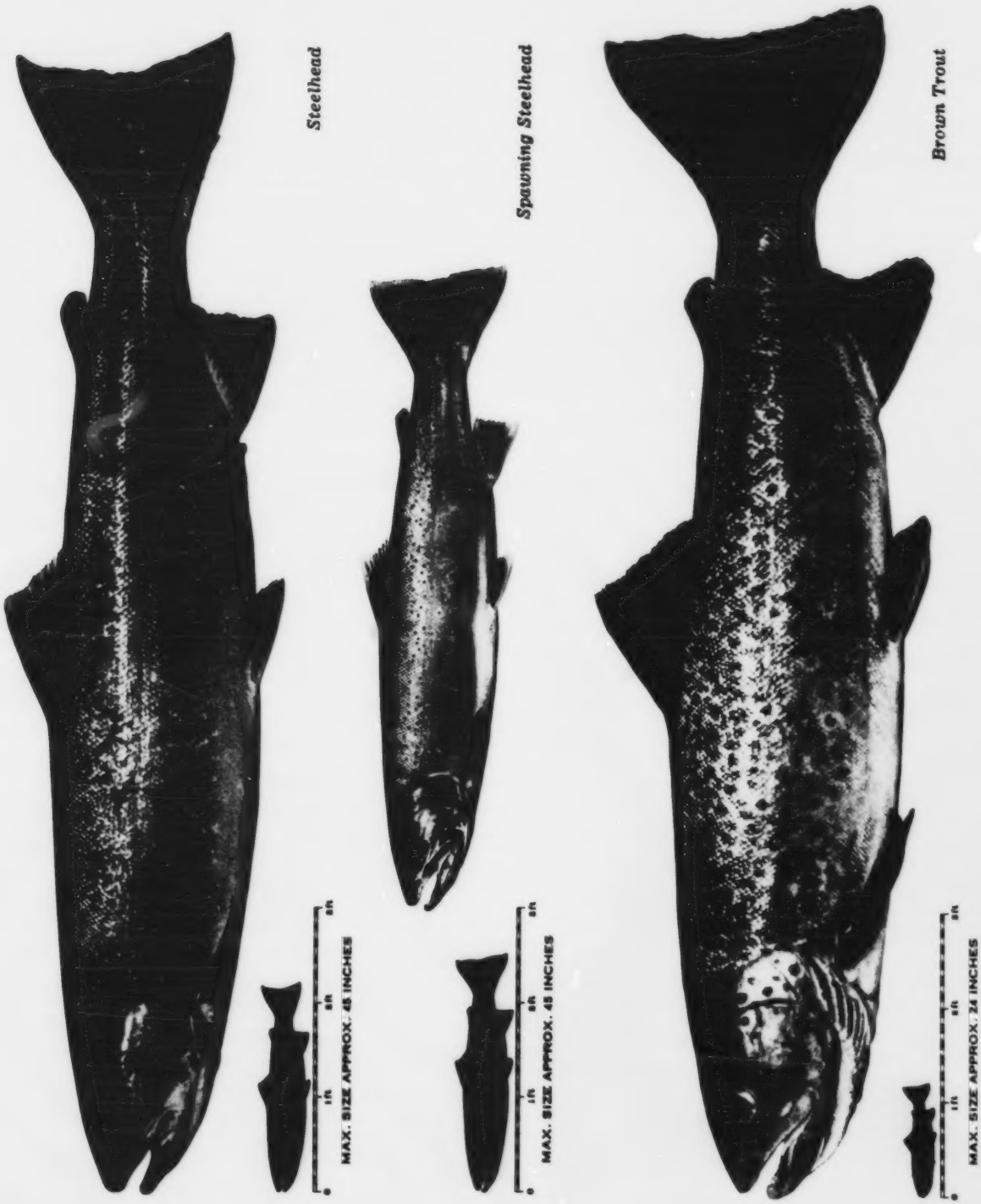
Lake Trout

Brook Trout
0
1ft
2ft
3ft
MAX. SIZE APPROX. 30 INCHES

Arctic Grayling
0
1ft
2ft
3ft
MAX. SIZE APPROX. 24 INCHES

Kokanee
0
1ft
2ft
3ft
MAX. SIZE APPROX. 16 INCHES

Spawning Kokanee
0
1ft
2ft
3ft
MAX. SIZE APPROX. 16 INCHES


Steelhead
MAX. SIZE APPROX. 45 INCHES
Spawning Steelhead
MAX. SIZE APPROX. 45 INCHES
Brown Trout
MAX. SIZE APPROX. 24 INCHES

Mountain Whitefish
MAX. SIZE APPROX. 20 INCHES
Burbot
White Sturgeon
MAX. SIZE APPROX. 15 FT.

8

ECOLOGY AND WILDLIFE MANAGEMENT

What is Ecology?

Ecology is the science of the environment; the study of how the world functions as a unit. The word ecology comes from the two Greek words: "oikos", meaning house or place to live, and "logos", meaning study of. Literally then, ecology is the study of organisms in their home; a study of the structure and function of nature, or of the relationships and interactions among living things and their surroundings.

It is important to understand the basics of ecology, as we humans are only one of approximately 1,300,000 types of organisms that share the planet. This chapter will examine the basic principles of ecology, the way they affect plant and animal communities, and the basic principles and activities of wildlife management.

What is an Ecosystem?

Ecologists are concerned with 6 levels of organization of matter — organisms, populations, communities, habitats, ecosystems, and the biosphere. The following definitions will help clarify these terms.

Organism: refers to all plants and animals, including humans. These living units include not only large organisms such as trees and whales but also the simpler species such as fungii, bacteria, and protozoa.

Population: a group of individual organisms (such as moose or fir trees) of the same kind (species). A population may be local or global, depending on the size of the area under study.

Community: the populations of plants and animals living and interacting with one another in a given locality.

Habitat: the place where an organism lives in a community, its "home". Habitats may vary widely in size, from an entire forest to a puddle. An organism's habitat contains its 4 essential needs for survival: food, water, shelter, and space.

Ecosystem: a community of living things interacting with one another and with their physical environment (air, water, soil, wind, etc.). An ecosystem can be a planet, a forest, a lake, or a fallen log.

Biosphere: the planetary ecosystem, or largest life unit, made up of all the ecosystems on earth and their interactions. The biosphere consists of 3 life zones: (1) above us, a thin layer of useable atmosphere no more than 11 km high; (2) around us, a limited supply of water in rivers, lakes, oceans, and underground deposits; and (3) below us, a thin crust of soil, minerals, and rocks extending only a few thousand meters into the earth's interior.

Ecology and Life on Earth

Ecology, then, is concerned with the interactions and interdependencies of organisms to each other and their environment within the biosphere, the area where life exists on the planet. This intricate region contains all of the oxygen, water, minerals, carbon, phosphorus, and other building blocks necessary for life.

If the earth were an apple, the biosphere would be no thicker than its skin. Everything in this "skin of life" is interdependent: all the earth's supply of oxygen, water, carbon, and other vital chemicals must be recycled again and again for life to continue. Air helps purify the water and keeps plants and animals alive; plants help renew the air and soil and keep animals alive; and the soil keeps plants and many animals alive; and helps purify the water.

The biosphere is a remarkably complex, effective, and enduring system. We are beginning to understand that disrupting the biosphere in one place can cause unpredictable and often damaging effects elsewhere. Ecology has shown us that every technological advance has a hidden price. It has also shown us that we must look beyond the immediate, short-term results of our actions if we are to get a true picture of their consequences. Our colour television sets and self-cleaning ovens are paid for with flooded valleys as a result of our increased demand for electricity. Pesticides that worked "miracles" in pest control also killed off many natural predators and created a total dependence on chemical control. Automobiles are responsible for air and noise pollution, as well as the large-scale damage that the production of steel, rubber, asbestos, and plastics causes.

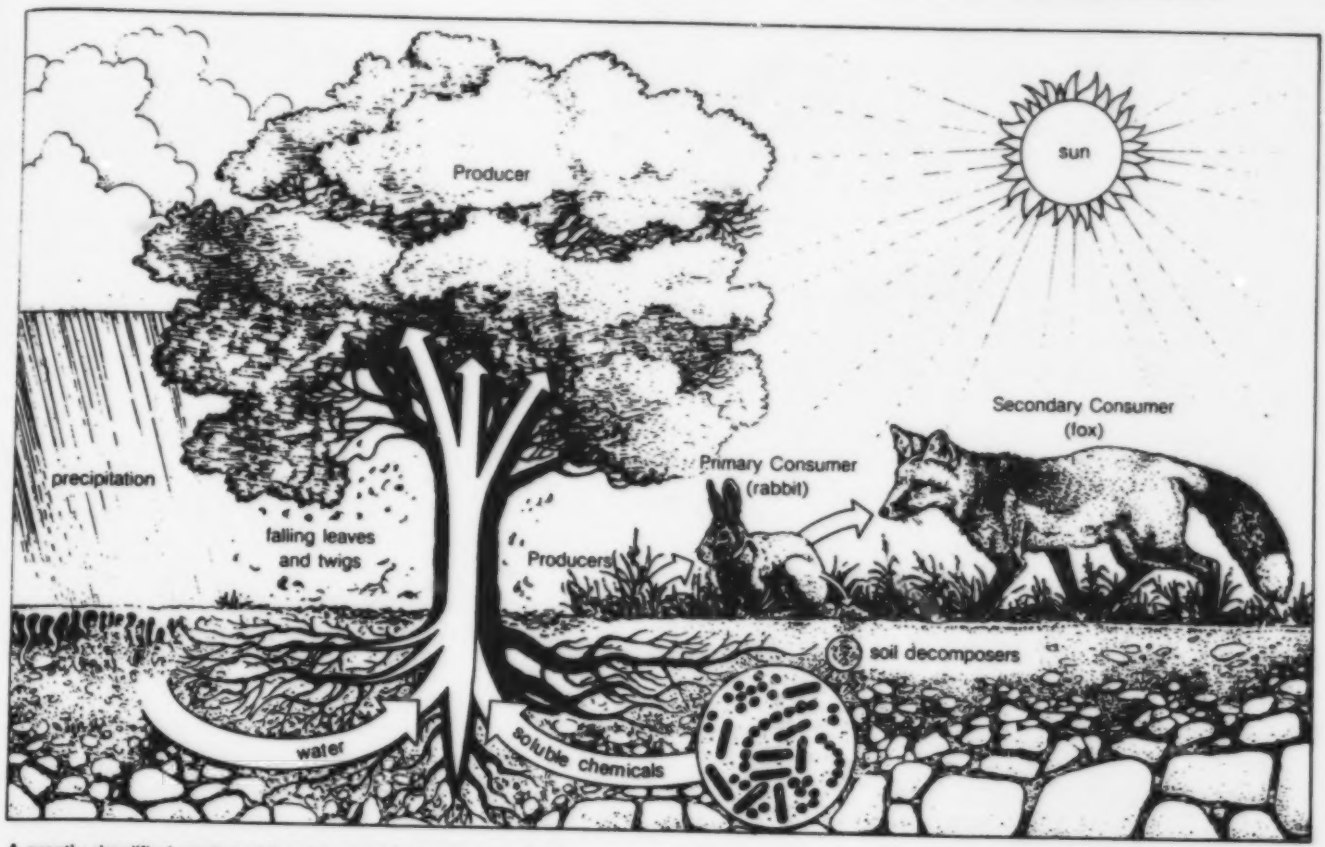
The goal of ecology is to discover the intricacies of just how everything in the environment is related. Using this knowledge, humans can work at co-existing within nature, rather than as conquerors of nature.

Ecosystems and Energy Flow

An ecosystem always has 2 major parts or components: non-living or "abiotic", and living or "biotic". The non-living part includes the sun, the source of energy for life on earth, air, water, soil, physical factors such as wind, rain, heat, and all the chemicals essential for life.

The living part of an ecosystem can be divided into food producers (plants), food consumers (animals) and decomposers (bacteria, fungi, etc.).

Food producers are the plants, that range in size from tiny floating algae to huge



A greatly simplified version of the structure of a forest ecosystem.

trees. Through a process known as photosynthesis, plants are able to use the sun's energy, carbon dioxide, and water to produce organic food substances. No other living thing on earth is capable of converting solar energy into food; therefore, plants are the basic, primary food source for any community.

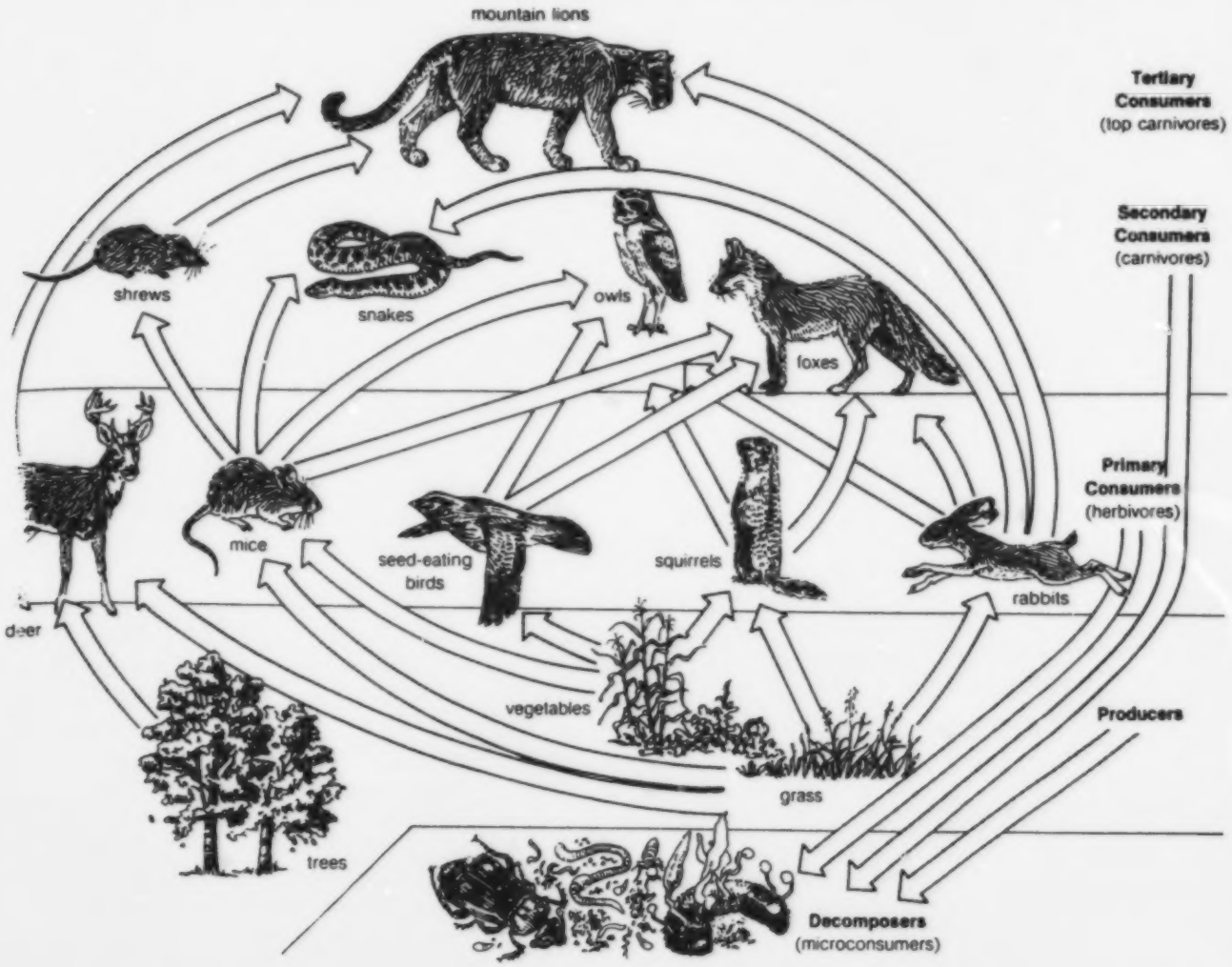
Food consumers cannot manufacture their own food and so must consume plants or other animals to obtain organic food compounds. There are four types of consumers:

Herbivores (plant eaters), such as deer, mice, rabbits and cows, feed on plants.

Carnivores (meat eaters), such as frogs, hawks, coyotes, snakes and cougar, feed on herbivores or other carnivores.

Omnivores (meat and plant eaters) such as bears, foxes, robins and humans, feed on a variety of both plants and animals.

Decomposers are tiny organisms such as bacteria, fungi, molds, termites and maggots that break down the bodies of dead animals and plants into simpler substances that can be reused by plants, completing the cycle of chemicals through the ecosystem. Decomposers clean up dead matter and recycle it, and so play a critical role in any ecosystem.



A greatly simplified land food web.

Food Chains and Food Webs

All living things are potential sources of food for other organisms. A caterpillar eats a leaf; a robin eats the caterpillar; a hawk eats the robin. When these organisms die, they are eventually eaten by the decomposers.

Generally, the flow of energy through an ecosystem is the study of who eats or decomposes whom. This sequence is called a "food chain" — a series of steps where food energy is transferred from one organism to another. The term "food chain" is quite simplistic, and the real situation in nature is much more complex. Many animals feed on several different types of food, and may then be eaten by a wide variety of other different predators. A better term is a "food web", as it more accurately suggests the complex series of relationships between

the many different organisms in an ecosystem. A food web is actually made up of the interactions of many food chains.

Cycles within food webs are completed with the return of raw materials from the decomposers via the soil or water to the primary producers, the plants. With the help of the sun's energy, these materials are then converted into plant material and returned into the food web.

The *web of life* is a term often given to the connections that tie together the ecosystems and therefore all living things. There is a limited supply of all the essentials for life on the planet, that all living things must share. Due to these dependencies and connections, it is inevitable that an action in one part of the web or environment will produce effects in many other parts. Chemical pesticides are a good example of the problems that can result when these connections are ignored. A farmer sprays his crops to kill a certain insect pest. When the insects have absorbed enough of the chemical they will die, but before hand, a large number will be eaten by birds. Birds are nature's way of controlling the insects; however, when they have eaten enough insects, they will contain a large amount of pesticides themselves. These chemicals accumulate and remain in the birds. When they are then eaten by a falcon, the concentration of chemicals in this predator will climb even higher. Many birds of prey are now in danger of extinction for just this reason.

Let's go a step further. If the insect eating birds accumulate enough poisonous chemicals, their own numbers will certainly decrease. Because these birds are the natural control of insects, their absence will probably result in a larger number of pests. The farmer, in a panic, may decide to use a larger dose of chemicals for insect control with the result that the birds will be reduced even further. At the same time, these large doses of chemicals will be strongly selecting for resistant insects. The final result, then, may well be large numbers of highly resistant insect pests with no natural controls, a disastrous consequence to what the farmer had in mind when he started spraying.

The Importance of Habitat

All living things have 4 fundamental needs: food, water, shelter, and space. An animal's habitat or "address" must provide these 4 basic needs. Each species of animal has its own habitat requirements. It seems obvious that wild animals need adequate habitat in order to survive, yet many people don't understand the vital role of habitat, although they are keen to protect animals. Without protecting habitat, protecting individual animals becomes meaningless.

Food, Cover, Water, and Space

Food

All animals need food to meet their energy needs: to grow, reproduce, escape predators, and survive chilling winters or long migrations. Each species selects very particular foods from many items that are present in its environment — just any kind of food will not do. For a bighorn sheep to survive, for example, there must be enough grass to last the winter, and the grass must also have sufficient nutritional value. The quality of food, as well as the amount present, is important for survival. Food quality may vary with the season, or even the location. Food must also be accessible to the animals. In winter, deep, crusted snows may bury much of the food supply. An important objective for wildlife management is to conserve important feeding areas, and to increase the amount and quality of food available for wildlife. *Winter food shortage is the most important limiting factor for many wildlife species in British Columbia.*

Shelter

Birds and mammals need shelter or cover to hide in, and to protect them from bad weather. Dense vegetation is the most common kind of cover, but cover may also include rock piles, burrows in the ground, holes in logs, or water bodies. Some small animals, like beaver and muskrats, build their own cover in the form of houses. Plant cover is removed by many modern land uses like logging, cattle grazing, and open pit mining.

Water

Water is needed by all animals. Many of our wildlife species get enough water from the food they eat, such as succulent plants, but some also need to drink water, particularly in dry regions like the Okanagan Valley. Fortunately, water is well distributed in British Columbia, and usually not in short supply.

Space

Animals need space to survive. Overcrowding leads to severe competition for food and breeding sites, and eventually to malnutrition and rapid spread of disease and parasites. Most animals are territorial to some extent; that is, they will occupy specific sites. Their territoriality tends to ensure spacing and prevent over-crowding. Because of the need for space, a given area will only support so many animals, no matter how much food, water or shelter they receive.

Many wildlife species have very particular needs for breeding sites. Dense forest cover is needed by cow elk to conceal their newborn calves, and by tree-nesting birds to hide their nests. Bald eagles need large old trees to support their bulky nests, and these trees must be near the shorelines where they feed. Hole-nesting birds need snags and old trees in which to excavate nests, falcons need cliff ledges, and seabirds that nest in colonies need secluded islands. Some mammals, like wolves and bears, need particular soil conditions for digging their maternity dens. Wildlife managers try to protect breeding sites, and to improve them where possible.

Distribution and Adaptation

The distribution of various species is determined by both local conditions and overall geographical features. Local conditions will determine where certain species are to be found. The arrangement of food, cover, water, and space, particularly breeding sites determines wildlife numbers and their distribution. Most species need more than one kind of habitat, and the best arrangement is where many patches of the various habitat types occur fairly close together. Extensive tracts of a single kind of habitat don't support as much wildlife. When there is a good interspersion of different habitats, many individuals will have ready access to all of their needs, and the area will support a larger population.

The Niche Concept

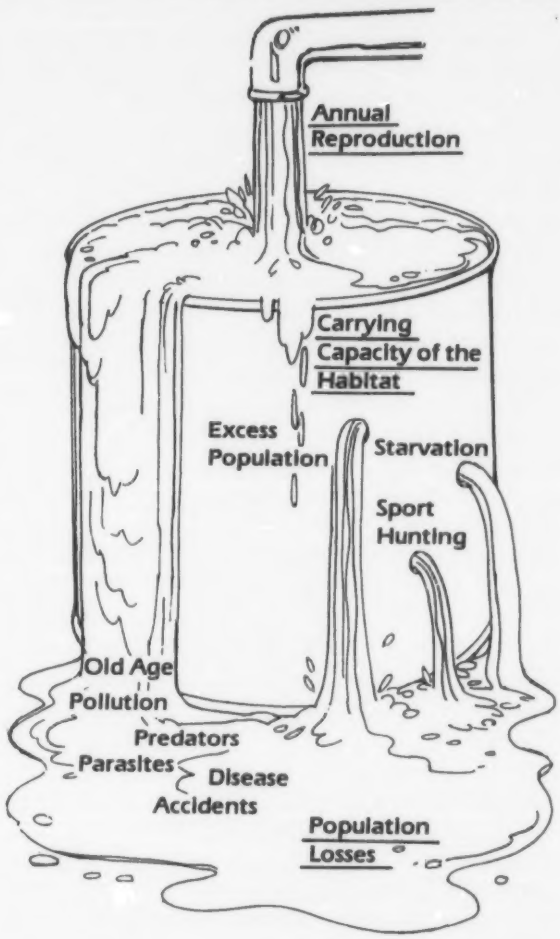
The ***ecological niche*** is a description of a species' total structural and functional role in an ecosystem. It includes not only the habitat or physical space where a species lives, but also what the species does in the ecosystem. A common analogy is that habitat refers to an organism's "address" in an ecosystem and that the ecological niche is an organism's "life-style" in an ecosystem.

The ecological niche, then, includes all of the physical, chemical, and biological factors that a species needs to survive and reproduce in an ecosystem. To describe a species' niche we must know what it eats and what eats it, where it leaves its wastes, the ranges of temperature, wind, shade and sunlight it can tolerate, the nature and range

of its habitat, its effects on other species and on the nonliving parts of its environment, and what effects other species have on it. Obviously, we can never know everything about the niche of any plant or animal. A particular animal may occupy different niches in different areas: a black bear, for example, may be a herbivore, a carnivore or, as is usually the case, an omnivore, and its effect on the rest of the community changes accordingly.

Animals and plants usually become well adapted to their environment and often develop special abilities that enable them to carry out their activities more efficiently. The wide variety of bird beaks in existence is evidence of just such adaptions. For example, an eagle's hooked, sharp beak is adapted for tearing and eating flesh, while a sparrow's blunt, wide bill enables it to crack and eat seeds and grains.

Some animals are highly specialized. Certain insects, for example, will feed only on a specific type of plant, and are found only where that plant is present. Species with less specialized requirements are often termed generalists: these organisms are able to respond to changes in the environment by switching food sources. For example, coyotes like to eat snowshoe hares, but if hares become scarce, they will also eat mice, voles, birds, and even insects and berries.



The Balance of Populations: Limits to Abundance

No matter how good a habitat is, and no matter how much protection is given to the animals in it, a given area will only support so many animals.

The number of animals that an area will support without damage to the habitat or to the animals is called the *carrying capacity*.

The uppermost limit on the size of a population is most often determined not by the animals themselves but rather by the availability of food. In general the growth of plants depends on the supply of nutrients and solar energy. The quantity of plant material produced determines, in turn, the maximum possible population of herbivores. The numbers of these animals will then set a limit to the numbers of carnivores.

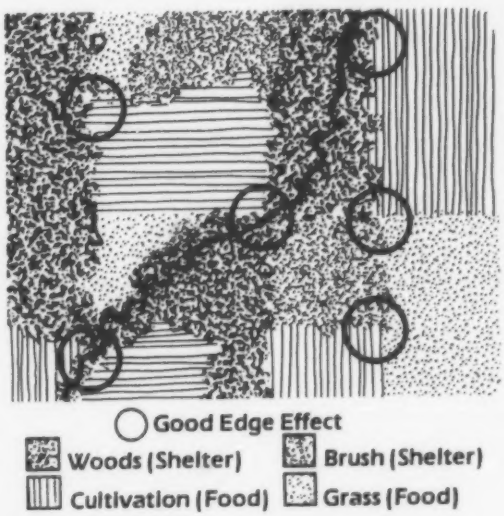
There may be factors other than food limiting the growth of a population, and so the maximum size of the population may never be reached. There may, for example, be enough food to support a thousand birds in a certain area but only suitable nesting sites for one hundred.

Birds and mammals can increase in numbers very quickly, and may temporarily exceed the carrying capacity of their habitat. This results in social stress, competition for food, starvation, greater exposure to disease, predation and parasites, poor reproductive success, and damage to the habitat. For example, multiplying muskrats can very quickly eat all the vegetation in a marsh, and then die out. Subsequently the damaged habitat has a reduced carrying capacity. A good trapper will watch the effects that muskrats are having on marsh vegetation and harvest the excess population before it damages the habitat.

In British Columbia, the carrying capacity of many wildlife habitats is determined by winter weather. There may be an excess of available food, cover, and space in summer, but not enough in winter. This is particularly true for species that eat plants because the vegetation dies back in winter, may be covered by snow, and is less nutritious.

It is the combination of available food and home range size which helps define the upper limits to population growth. Many animals occupy specific home ranges or territories in order to ensure that they have enough food, cover, and breeding sites to raise their young. The territory size reflects the carrying capacity of the habitat; territories function to limit the number of animals supported in an area.

Most animals are food for other animals, and when their population increases, so does the number of predators. Once the prey population has been reduced, there may be less food for some predators: their numbers will decline and an equilibrium may again be restored. It was not too long ago that various creatures were classified as either "beneficial" or "detrimental" according to their supposed effect upon populations valued by humans. Ignorant of the role played by predators in the regulation and maintenance of prey populations, many agencies actively promoted widespread killing of predators with the result being in some areas the destruction of habitat by a prey species growing out of control. It soon became obvious that **all** parts of a community, including predators, were valuable.



Stability

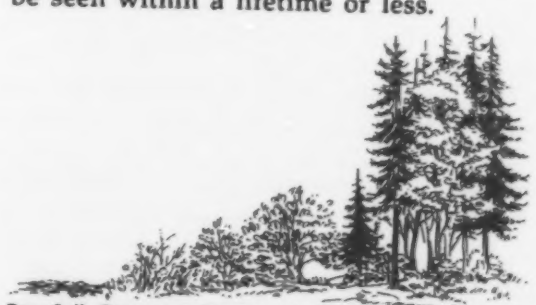
Organisms, populations, and all natural systems have some ability to withstand or to recover from externally imposed changes or stresses. In other words, they have some degree of stability. Nature is remarkably resilient. For example, plants can eventually recolonize an area devastated by volcanoes, fires, and even paved parking lots. It is not known how most ecosystems maintain their stability, and there are a number of theories, but one factor is thought to be complexity. Complexity relates to the number of species and the interdependence of those species with each other and their environment. With many different species and ecological niches, impacts are more widely shared, and the system has more ways to respond to environmental changes. A parallel to this idea is the fact that a city with a variety of industries is more stable economically than one where the economy is based only

on one or a small number of products. In other words, "variety is the spice of life".

Unfortunately, we humans often simplify the complex systems of nature for our own benefit and use. Every dam, cornfield, highway, pipeline, and use of insecticides makes ecosystems more simple. We burn or bulldoze fields and forests containing thousands of interrelated plants and animals and cover the lands with buildings, roads, or fields usually containing single crops, such as wheat, corn, or alfalfa. However, due to their simplicity, fast-growing, one-crop systems are highly vulnerable. They must be protected with chemicals, time, money and energy resources. Just a single disease or pest can wipe out an entire crop unless we protect it with pesticides and herbicides, and support the crop's growth with chemical fertilizers, irrigation, or other means to overcome natural limits.

Succession

Communities are always changing and dynamic, never static. Most of the natural changes in a system result from the interactions between the soil, plants, and animals in the area. Those changes are known as *succession*. An example of long term succession is the gradual change of a lake, first to a marsh, then to a meadow, and finally to a forest. The process may take thousands of years as the lake gradually fills with sediment and one kind of community replaces another. Shorter term successional changes are more apparent to people, because dramatic differences can be seen within a lifetime or less.

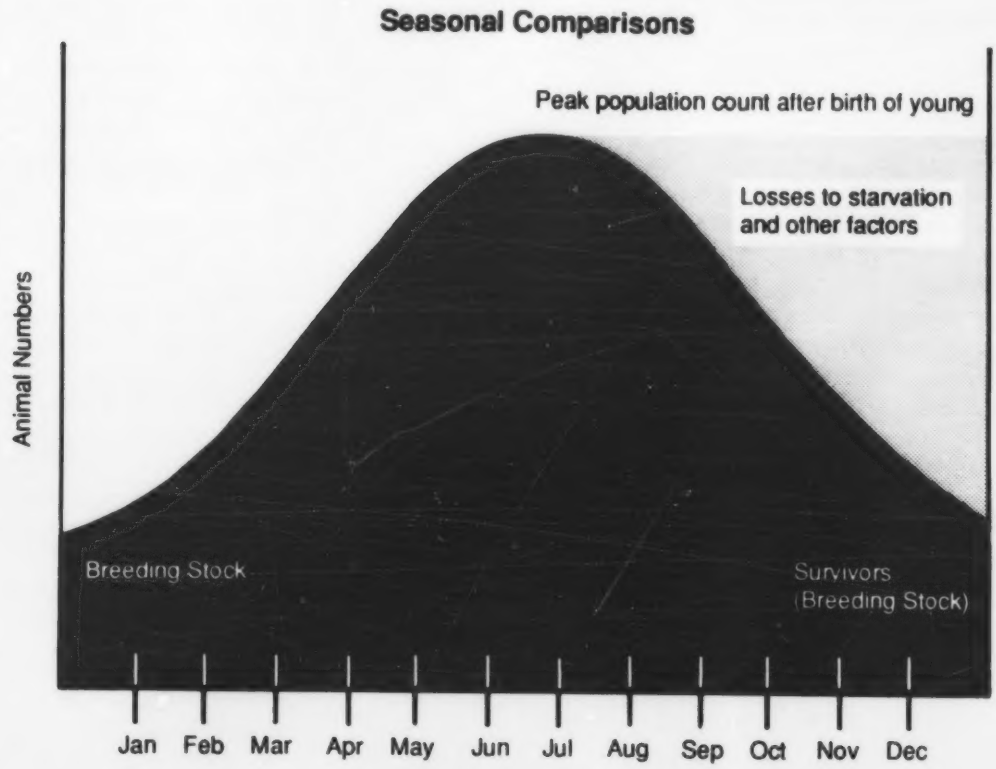


Succession can also be human-caused. A disturbance such as a forest fire, logging, or land clearing will accelerate the natural processes of change. For example, after logging or a fire in a coniferous forest, a rich growth of grasses and other herbs becomes established along with the animal species favoured by them. They can be replaced by shrubs and seedling trees, often there are fast growing species such as willow or lodge pole pine, and still other animals. Those are eventually replaced by a dense growth of conifers which then grow into a mature forest and associated animals. Succession can take decades, or even centuries, depending on the plant and animal species involved and site characteristics such as soil, elevation, and climate.

Human-caused succession may also include the prevention of natural wildfires, and livestock grazing.

Fire is recognized as a valuable tool for wildlife forest managers. On the other hand, prevention of natural fires often results in vegetation communities which are of low value to many types of wildlife. Also, the accumulation of deadfall and dry underbrush which would have undergone normal, periodic burning can result in severe massive blazes that can impair long-term productivity by diminishing the soil base. However, logging and prescribed burning can replace natural wildfire on most sites.

Excessive livestock grazing may maintain grasslands in a perpetual early vegetation stage by removing organic material and thereby limiting soil development. Tastier plant species are eaten first, before the less palatable ones. Plants that are short-lived and that produce many seeds are often passed over in favour of the longer-lived species; many of the grassland weeds are annual grasses and herbs.



Population Dynamics

"Dynamic" means changing: *population dynamics,* then, refers to the changes in structure and composition that occur in populations. Density, age, and productivity are the three main considerations of population dynamics.

There are many environmental factors necessary for the growth of an animal population. Food, water, breeding areas, and a variety of other factors combine to limit the carrying capacity of a habitat. Animal populations respond to a change in the carrying capacity with a corresponding change in numbers: if conditions improve, the population will increase and if conditions degrade or habitat is lost, the population will decrease. Wild animals can never be "stockpiled" in excess of the carrying capacity of a habitat; temporary measures such as winter feeding of starving deer or moose only intensifies the real problem of bringing the population into balance with its habitat. Birth rate and death rate are two processes of major importance in population dynamics. Since most animals produce many offspring, and we don't see the population numbers constantly increasing, it follows that the death rate is also high. Those with the highest birth rates also have high death rates. The causes of death, such as starvation, disease, predation, accidents, weather, and hunting are called mortality factors. For example, weather can cause great variation in both the production and the survival of young. Any of the mortality factors may be important in particular places at particular times. Wildlife biologists take the different birth and death rates into account when managing wildlife populations.

Habitat: The Critical Factor

It should be obvious by now that suitable habitat is a critical requirement for the survival of wildlife. Most management decisions are subject to the limitations of living space for the animals.

British Columbia has fourteen distinct climates which are superimposed on seven basic landform systems. When combined, they form 30 distinct regional ecosystems. For simplicity's sake the province can be separated into six kinds of land, each with a different climate, soils, habitat and land uses:

(1) *The lowlands, which are composed of the large basins, the Rocky Mountain Trench and the Fraser Delta.* They have the warmest and driest climates and the most productive soils in the province. These areas also have the most productive big game winter ranges and the greatest diversity of wildlife species. Unfortunately, these areas are also the most sought-after by humans, for habitation, industrial, agricultural and forestry activities, and for construction of roads, railway lines, and power lines.

(2) *The plateaus and valley bottoms within the mountains.* These areas are generally used as summer ranges by big game, but there is some winter range potential along the floodplains, on the southern slopes, and in the old-growth forests. The primary land use is logging. Nearly all hydro-electric reservoirs occur in this setting, and agriculture is most often marginal.

(3) *The isolated coastal inlets, islands and estuaries.* These are often steeply forested, rocky areas with little access to the large population centres except by boat or over logging roads. Camps or small towns are usually located on the productive estauries. Land use is mainly logging, although there is some mining. Productive wildlife habitat is restricted to the estuaries, the seepage zone above the ocean and isolated islands.

(4) *The southern roadless mountainous areas.* These areas are the rugged, upper mountain areas and high-elevation basins. They contain some of the most rugged and inhospitable land in the province: the Coast, the Selkirk and the Purcell Mountains. There is very little human land use, except for the occasional mine. The most prevalent big game species are mountain goat, grizzly bear and black-tailed deer or mule deer.

(5) *The Northeast or Alberta Plateau of the northern boreal plain.* The extensive clay and silt soils that were laid down in large glacial lakes coupled with the long, sub-arctic summer days are suitable for cereal grain production. This area has productive oil and natural gas reserves. There are moose, mule deer, white-tailed deer and elk winter ranges in the lowland areas, while the uplands are used as both summer range and extensive winter range for moose and caribou.

(6) *The northern wilderness.* These areas are boreal or sub-arctic mountains and plateaus. Few people live here, and the few established communities are small and scattered. The main land use practices are guide-outfitting and mining. These areas represent the largest wilderness in the province and are the domain of Stones's sheep, woodland caribou, mountain goat, wolf, grizzly bear and moose.

In measuring habitat, we must consider quality as well as quantity of land. Many of the areas critical for wildlife are also in great demand by humans for other reasons. Valleys are good habitat for many animals but, unfortunately, also make the best agricultural areas or good reservoirs. Delta areas essential for waterfowl breeding often have high real estate potential. Where we share areas used by wildlife, as in cattle ranching, we often ignore the needs of the native wildlife for the sake of other land use interests.

Some Definitions

Wildlife Species are classified into the following categories:

Game animals are defined by law and are generally valued for food, for particular products such as hides or feathers, and for the hunting opportunities they provide. Big game animals include bear, caribou, deer, and moose. Upland game birds include ruffed grouse, spruce grouse, ptarmigan and ring-necked pheasant. Migratory game birds include ducks, geese, band tailed pigeons, and some shore birds.

Furbearing animals are defined by law and are generally valued for furs. Other parts of the animals such as the meat are usually unimportant. Furbearing animals include lynx, coyote, pine marten, and mink.

Non-game animals are those not hunted for sport or trapped for their furs. Songbirds, predatory birds, small mammals, reptiles, and amphibians are included in this category.

Endangered species. These species are in danger of extinction, as humans have encroached upon or destroyed their habitat. British Columbia animals on the endangered species list include the white pelican, the sea otter, the burrowing owl, and the Vancouver Island marmot.

Threatened species. These species are also in danger but their position is not so acute. Both endangered and threatened species are protected under the Wildlife Act.

WILDLIFE MANAGEMENT

In the following section, the main principles and practises of wildlife management are outlined, as well as some of its challenges and limitations.

What is Wildlife Management?

Wildlife management is a bewildering term to many people. Part of the reason for this is that the field as we know it today is relatively new: the first provincial wildlife biologist was hired as recently as 1947. Others don't understand the concepts and practises behind wildlife management. Why would a moose or a robin need to be managed? Can't we just let nature take its course? In a wilderness setting sometimes we can, but sadly, there is little true wilderness left, even in a province as large as British Columbia. There are no places where we humans have not intruded in some way, changing the environment and using natural resources to suit our own purposes. The concept "wild" creates some problems, for "wilderness" and "wild" generally mean "in the absence of humans". In attempting to manage wildlife, we as humans are obviously influencing them, but a measure of our success is the degree to which we keep wilderness and wildlife "wild". In British Columbia, wildlife management is a complicated, many faceted field, that involves the public, the users, private industry, government managers, and law makers.

Wealth of Wildlife

British Columbia has more diversity in its landscape than any other province in Canada. British Columbia's large size, coastal location, and mountain ranges present a great variety of terrain and contrasting climates. There is also a great diversity of plant life. Within the province there are grasslands, shrublands, alpine tundra, arid areas and swamps, lake-land and river bottoms, as well as many kinds of forests such as coastal rain forests, boreal, and subalpine forests.

In this geographic and climatic mix there are many different sorts of habitats, or places

for wildlife to live, and many kinds of animals are able to live in British Columbia — considerably more species of birds and mammals than in any other province. Seventy-one percent of all the kinds of birds that nest in Canada, and 74% of the mammal species that live in Canada, are found in British Columbia.

Many people benefit from British Columbia's diverse wildlife heritage. Wildlife provides food, income for trappers, hunting and tour guides, fur traders, and taxidermists and recreational hunting for city and country dwellers alike, opportunity for scientific research, study for naturalists, and aesthetic pleasure for everyone.

Wildlife, like forests, water, fisheries, and soils, is a natural resource. Wildlife is used directly by many people and influenced directly and indirectly by the numerous ways humans use other natural resources. Wildlife management employs our understanding of how animals, their environment, and people interact. It operates through programs such as habitat protection and improvement, harvest regulation, and wildlife protection to insure the present and future welfare of wildlife.

Wildlife management falls into several categories, such as protection and management. This section will review the main objectives and procedures that form the basis for managing wildlife.

PROTECTION

The protection of wildlife involves both provincial and federal legislation, planning agreements, and enforcement. Under authority of the provincial Wildlife Act, Wildlife management programs in British Columbia are primarily the responsibility of the Wildlife Branch in the Ministry of Environment. However, the provincial wildlife branch has little control over the land and habitat upon which wildlife depends. Much of the province's land base is either controlled by other government agencies (92%) or privately owned (7.5%). Even on the best habitat where the land has been assigned to the Wildlife Branch (less than 1%) prior resource commitments, such as timber or range, impede wildlife habitat management. Thus, a major component of the Ministry of Environment management strategy is the participation in cooperative planning processes with other government agencies and with private developers.

Many government ministries and resource laws are designed to promote development and profit on an individual resource management level. Often these efforts are conflicting or contradictory, and require government intervention and an overall, integrated provincial land-use planning policy. Without such a process, wildlife habitat will be protected and managed only on a local area basis. However, through coordinated planning, there are a number of options open for wildlife managers through cooperation with the Ministries of Forests, Parks and Fisheries, private foundations, and other agencies.

Protection Through Reserved Lands

British Columbia's over 600 species of birds, reptiles, amphibians and mammals receive protection in a number of parks and reserves set aside for general conservation purposes, and also in places set aside specifically for wildlife.

Additional lands in and around the fringes of many towns are closed to hunting, mainly for human safety, but nevertheless provide effective year-round rest areas for many kinds of wildlife. Many regional and municipal parks, particularly on the Lower Mainland and Vancouver Island, provide safe refuges and protect wildlife habitat. Local sanctuaries operated by conservation groups also provide small refuges.

Reserved lands represent one end of the spectrum of wildlife management, where species and their habitats are preserved to the benefit of hikers, campers, photographers, birdwatchers, and all students of nature. But despite the number of areas involved and their high priority for wildlife, reserved lands comprise less than 7% of the area of British Columbia.

MANAGEMENT OF THE HABITAT

The state, age, and condition of a species habitat are critical to wildlife abundance. Through natural causes, important wildlife habitat may become unsuitable for the production of some animals, as when a burned-over forest that can provide ample winter forage for moose becomes dominated by second-growth lodgepole pine, and the forage production is reduced to near zero.

Logging and burning are responsible for significant changes in wildlife distribution and abundance. Forest harvesting which displaces one or more species often leads to major improvements in habitat conditions for other species. Certain species, such as woodland caribou, pine marten and pileated woodpeckers, are dependent upon old-growth or mature forests, while other species such as moose, snowshoe hares, and blue grouse do best in shrublands. Logging or burning, which remove the forest canopy, expose the soil surface to sunlight and releases nutrients which increases growth of herbaceous plants. Thus, while the habitat of old-growth, forest-dependent species may be destroyed by logging or fire, other species that are dependent upon early shrub communities often benefit. However, generalizations are often misleading, since some species may require both old-growth and shrub communities, depending upon such factors as human disturbance, snow-depth, winter and summer temperatures, and season of use. The arguments that logging benefits wildlife or even that "good logging is good for wildlife" are dangerously misleading. The great diversity and complexity of habitats and wildlife requirements in British Columbia, coupled with the complexities of individual species requirements, make it essential that wildlife management be incorporated into forest management.

Livestock grazing can be damaging to ground-nesting birds by the removal of cover and through trampling. However, by changing the grazing period to after the nesting season, grazing and wildlife can be compatible. By reducing the number of livestock that graze a range, or by better stock distribution through proper fencing, and waterhole and salt development, there can be forage for both livestock and wildlife.

Predator Control

Of all activities that a wildlife manager or the government does in the name of wildlife management, none is more controversial than predator control. There are several ways to consider animals: as individuals, populations, or as part of an ecosystem.

Control of livestock predators such as wolves, cougars, and coyotes is conducted regularly in agricultural areas. Black bear and lynx are also controlled. Society has deemed that the protection of livestock comes first in these cases. Predators are also controlled around fish and poultry farms. Unfortunately, some protected species such as golden and bald eagles are still hunted illegally by some individuals.

Predators may also be reduced to protect big game stocks when the wildlife manager is faced with trying to manage one species (deer, moose, caribou, etc.) while another (wolves, cougar, coyotes, etc.) is causing excessive mortality. The choices are not simple, for the management of one species or population may be in conflict with the

management of others. Also, various sectors in our society place different values on predators and game species.

Transplanting

Animal populations have often been wiped out in areas through human activities, or sometimes habitat may be vacant naturally, simply because a species never found it. Through the capture and transplant of individuals to these ranges, new populations can become established. Several herds of California and Rocky Mountain bighorn sheep, and Rocky Mountain and Roosevelt elk have become established in British Columbia in this way, which helps to augment our natural populations. In most cases these transplants have been so successful that hunting seasons have been permitted.

Some planned transplants have included exotic species, such as ring necked pheasants and chukar partidge, and while these were successful many others were not. For example, red deer were transplanted to the Queen Charlotte Islands, and Hungarian partridge were transplanted to the Thompson/Okanagan. Both were unsuccessful. Some unplanned or careless transplanting of species has been damaging, such as the European starling which displaces other birds from their nests, or the racoons on the Queen Charlotte Islands which now threaten many of the nesting sea-bird colonies.

MANAGEMENT OF THE HUNT

Wildlife management is not hunting. There is no need to hunt animals in order to manage wildlife. However, hunting is one activity that depends on wildlife management. In pioneer days, British Columbia settlers could shoot almost any wildlife anywhere, any time. Gradually, restrictions on hunting have increased to protect and conserve the province's wildlife. Regulations are based on estimated population numbers, habitat evaluations, and external pressures on the populations.

The number of young produced by each wildlife species varies. Frogs and toads produce thousands of tadpoles. Grouse, ducks, and varying hares produce 8 - 14 young per year. Deer, moose, and elk, while capable of producing twins and even triplets, average one young per adult female each year. Female grizzly bears generally only produce one cub every two years. Therefore, the number of each species that can be harvested and still not diminish the population varies with the reproductive capacity of that species.

Animals produce more young than the habitat can sustain into adulthood. Through diseases, starvation, predation or accident, no more animals will attain adulthood than the habitat can sustain; through habitat manipulation and the elimination of predators this number can be increased, but there still will be more animals born than will be maintained as adults. This principle is called the harvestable surplus. The only populations that do not have such a surplus are those that have only adults that are past their reproductive years.

Humans hunt only select species of wildlife, for their fur, meat, trophy value, or the challenge they bring to the hunt itself.

The animals that we hunt are selected as much by social pressure as by the usefulness of the animal to us. For example, many seed-eating birds or shorebirds that are not hunted are as palatable as the species that are hunted. A few species that are hunted, such as mergansers and scoters, are less palatable. Other animals are hunted for their trophy value, such as prime mountain sheep rams. These animals may not be the highest quality eating, but they are hunted for their horns and also because of the great difficulty in pursuing them.

Hunting seasons can take many forms, from open, autumn-long seasons on grouse and ducks, to more restricted seasons on males, e.g. pheasants. Animals with high reproductive rates and which are sought after for food generally have a longer season than do animals that are hunted as trophies or that have low reproductive rates. However, some animals, such as elk and moose, may belong to both groups, food as well as trophy animals. General open seasons on the males often reduce the number of both young males and mature or prime breeding males. The number of yearling or mature females that are harvested can be similarly effected. Restrictive seasons must be in place in order to provide adequate numbers of prime breeding females and males needed to maintain the herd, while hunters can pursue the harvestable surplus. The harvesting of young of the year (i.e., calves and fawns) is good management, as many more young are produced than will survive or that the habitat will support during the winter months. By reducing their numbers, the surviving calves and fawns will have better opportunities to survive the winter.

Types of Hunting Seasons

In British Columbia there are two main types of hunting seasons: General Open Seasons and Limited Entry Hunting. General Open Seasons provide equal opportunity for anyone with a valid hunting licence and the appropriate species licences to hunt. Harvest restrictions are placed on the length of season, sex, and age of animals to be hunted. There is no restriction on the number of hunters that may participate, or where they can hunt within a Management Unit.

Limited Entry Hunting provides equal opportunity for anyone with a valid Hunter Number to submit their name for entry in any draw in the province. However, the number of eligible permits has been predetermined by the Wildlife Branch's Regional Wildlife Biologists. As with General Open Seasons, harvest restrictions are placed on the length of season, sex, and age of animals to be hunted. In addition, the number of each sex or age and the length of season for each permit can be assigned.

Limited Entry Hunting provides an opportunity for hunting game of limited supply which would otherwise have to be closed in General Open Season hunting. Limited Entry Hunting also provides for better hunter distribution and better selection of animals of specific age and sex. General Open Seasons provide the hunter with opportunistic hunting, with less planning and a greater choice of hunting areas.

Population Inventory

In order to exert careful control over the level and nature of the harvest of game, wildlife managers need a great deal of information about game populations. Most importantly they need an estimate of the number of animals in the hunted population, and the number taken each year. Estimating the number of animals present is called inventory. Biologists use aerial surveys for most big game animals, particularly in interior and northern British Columbia. The animals may be counted and classified on sample plots or entire winter ranges. When leaves have fallen from the trees and snow is on the ground, dark animals like moose are fairly easy to spot.

However, animals like coast black-tailed deer, grizzly bears and blue grouse, which occur year round in fairly dense cover, are much harder to spot. A different approach must be used for them. Managers use clues such as trends in observed animals, hunter success, or the ages of harvested animals to provide an index of the status of a population.

To be realistic, an inventory should also assess the land base that sustains the population. Our ability to inventory has been enhanced by the use of aerial surveys, using airplanes and helicopters; by improvement in optics, primarily night-vision scopes; by the advancement of remote sending imagery; and by the development of electronic technology, particularly computers and radio transmitters. It has also been enhanced through new knowledge about the game species' biology, behaviour, and habitat requirements. For many species, it is easier to measure and assess habitat components than to attempt actual population inventories. This is due to several factors such as the seasonal fluctuations of populations, the difficulty and expense of observing and or tracking individual animals, and the complexities of external influencing factors such as predation and competition.

Therefore, wildlife managers need to look for an appropriate mix of population and habitat evaluations to support their management decisions. Once wildlife habitat is classified, selective population surveys can be done to monitor population status, and to provide benchmark carrying capacity estimates. Long-term monitoring of wildlife populations can be done through a combination of habitat assessment and periodic population surveys.

Hunter Sampling Techniques

Several hunter sampling techniques are important inventory tools in determining the age and numbers of animals harvested. Information about animals harvested is gained through compulsory reporting, mailed questionnaires, telephone surveys, and through the "tooth return" program.

The Wildlife Branch requires that species that are in limited supply or that have critical population limits, such as cougar, grizzly bear, mountain goats, and mountain sheep, be inspected by a Wildlife official. The purpose is to determine the age and sex of the animals being harvested as a means of monitoring the population.

Mailed questionnaires and telephone surveys assist the Wildlife Branch and the Canadian Wildlife Service in determining the numbers of hunters in each Management Unit, the length of their hunts, and their success. Thus, changes in harvesting and hunting pressure can be detected.

An important method of aging the harvested animals is through the tooth return program. A self-addressed envelope, including a card for the name and address of the hunter plus harvest information, is given to each person who is selected in the Limited Entry Hunting draw for deer, elk, and moose, or for persons buying open season deer, elk, or moose licences (except on Vancouver Island). It is expected that every successful hunter who has received such a card will return an incisor tooth (even for fawns and calves) to the Wildlife Branch. By grinding the tooth root lengthwise, the annual growth rings can be counted to determine the animal's age.

THE CORE EXAMINATIONS: INFORMATION AND HELPFUL HINTS

The two exams, written and practical, may be taken in any order. Examinations are available only from examiners approved by the CORE Coordinator.

Written CORE Exam

The written test consists of multiple choice questions. The length of the exam is 1 hour. You must bring an eraser tipped pencil and an unmarked copy of the current hunting regulations synopsis with you into the exam for use as a reference.

Should you have serious difficulty with reading that will affect your ability to take the multiple choice test, discuss your problem with the certified examiner prior to your examination date.

Be sure to read each test question and choice of answers carefully before marking the one best answer to the correct questions on the answer sheet provided by the examiner.

After the examination is marked you will be told of your results. An examination may not be retaken on the same day it was last attempted. A small standard fee will be charged by the examiner for each examination attempt.

Choose the one best answer:

Some sample exam questions:

1. When approaching another person a hunter should:
   a) unload the firearm
   b) point the firearm toward the ground
   c) place the firearm in its case
   d) make sure the safety is on

2. A distinguishing feature of adult moose antlers is:
   a) wide flat plates
   b) forking spikes
   c) the brow tine
   d) spiral shape

3. An accident victim should be moved away from the accident scene:
   a) in a semi-prone position
   b) as soon as possible
   c) only if necessary
   d) after regaining consciousness

4. Calibre is a measure of the:
   a) size of pellets in a shotgun shell
   b) inside diameter of a rifle barrel
   c) amount of powder in the cartridge
   d) weight of the bullet

5. Diving ducks:
   a) are often seen in large flocks
   b) have graceful shapes, with long wings and necks
   c) are generally the most colourful with metallic speculums
   d) often fly in formation

6. It is legal to carry a loaded weapon in a motor vehicle:
   a) when off arterial or secondary roads
   b) when the firearm is secured to the vehicle
   c) if the firearm is visible and not concealed
   d) at no time

7. If lost, your chances of soon being found would be increased if you:

   a) prepared a shelter each evening
   b) had informed someone of your intended destination and expected return
   c) kept moving to increase the chances of being located by a rescue party
   d) were alert throughout each night

8. A bullet fired from a .22 calibre rifle should be considered dangerous up to:

   a) 1660 metres or 1 mile
   b) 300 metres or 330 yards
   c) 1000 metres or 1100 yards
   d) several kilometres or over two miles

9. If a hunter wounds a bird or animal he should:

   a) allow it to escape and recover
   b) use a more powerful firearm
   c) spend the time to find it
   d) be sure to aim more carefully the next time

10. Which of the following is found throughout B.C. in all habitats from coastal island beaches to alpine areas:

    a) black bear
    b) grizzly bear
    c) bobcat
    d) lynx

Correct Answers:

1. (a) 2. (a) 3. (c) 4. (b)
5. (a) 6. (d) 7. (b) 8. (d)
9. (c) 10. (a)

PRACTICAL FIREARMS HANDLING EXAM

Available only from certified CORE examiners, this test is to determine that the student can safely and knowledgeably handle firearms and ammunition. The test is based upon information found in the Firearms Safety chapter of this text. The examiner will supply the firearms for testing purposes. The firearms safety examination does not require live firing for its successful completion.

During the practical firearms test, you will be asked to select, pick up, carry, load and unload specified types of firearms and ammunition under various conditions. The questions asked you by the examiner will provide you the opportunity to demonstrate detail in your firearms handling safety knowledge and skill.

After the examination is completed, you will be told of your results. An examination may not be retaken on the same day it was last attempted. A small standard fee will be charged by the examiner for each examination attempt.

Your address and record of examinations will be recorded by the examiner on a registration form. Keep your registration form showing the record of examinations secure. Loss of the registration form may require retaking examinations you have already successfully completed. Should you pass one examination, either the written or the practical test, and wish to take the second test at a later date, keep the original copy of the registration form and one attached copy and present them to the future examiner at the agreed time of your next exam.

CORE Graduate

Once both the written and practical examinations have been successfully finished the examiner will complete the graduate information on the registration form and award the CORE graduate certificate to the student.

The CORE graduate certificate may be taken to the nearest office of the Government Agent in application for a B.C. Resident Hunter Number Card. This card may be used at any retail licence outlet to obtain a B.C. resident hunting licence each year.

The completed original copy of the CORE registration form containing the student's name and address, a complete record of examinations and the CORE graduate certificate number and date is sent by the certifying examiner to the CORE coordinator for permanent record keeping.

AN OPEN LETTER TO NEW HUNTERS

Since resident hunting began, sports-minded people have banded together to form clubs, associations and groups of similar kind. The first "rod and gun" clubs in British Columbia date back to the late 1800's. New clubs are being formed all the time. About forty years ago, hunter conservationists began to realize that some kind of umbrella organization was needed to give a larger voice for conservation and to protect the hunting opportunity for all qualified hunters.

The British Columbia Wildlife Federation was created out of that need. The "Fed" has been in existence for nearly four decades and is the recognized voice of hunters and anglers in British Columbia.

There are about 150 member clubs affiliated with the British Columbia Wildlife Federation and many thousands of "direct" or individual members as well. Many of the clubs have shooting ranges (for rifle, shotgun and handgun), an important consideration for people who live in cities and lack a place to sight-in or practice.

Many of these clubs engage in hands-on conservation projects of many kinds. These projects include such things as winter feeding of game animals, prescribed burns on winter ranges, thinning overmature browse to create better winter feed, and transplanting big game animals to suitable habitats in other parts of the province. There are fisheries projects too. Clubs have been active in habitat restoration of spawning streams, helping with egg takes, and some clubs have built and operate their own hatcheries.

Licenced hunters are privileged to use the wildlife resource. They have a responsibility to be safe, law-abiding citizens. But they also have a responsibility to ensure that the wildlife resource will be there for future generations to use as well. That is the work the British Columbia Wildlife Federation is committed to. The Federation office can give you the address of the club in your area. Or, you can become a direct member. Either kind of membership gets you liability insurance and a subscription to the Federation magazine.

Good Hunting!

British Columbia Wildlife Federation
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